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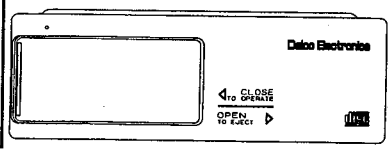
PION-05220

# Service Manual




ORDER NO.
**CRT1853**

MULTI-COMPACT DISC PLAYER

# CDX-M2016ZG US

COMPACT disc DIGITAL AUDIO

- **This model has been installed in Delco .**
  **Delco No. : 16220776**
- **See the separate manual CX-633(CRT1658) for the CD mechanism description and disassembly.**
- **The CD mechanism employed in this model is one of CX-633 series.**

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K-FFM. MAY. 1996 Printed in Japan

# 1. SPECIFICATIONS

General
System ..... Compact disc audio system
Usable discs ..... Compact Disc
Signal format ..... Sampling frequency: 44.1 kHz
Number of quantization bits: 16; linear
Power source ..... 14.0 V DC
(10.5 - 16.0 V allowable)
Dimensions ..... 275 (W) × 93 (H) × 172.2 (D) mm
Weight ..... 2.9kg

Audio
Distortion ..... 0.1 % or less(20 kHz)
Signal-to-noise ratio ..... 80 dB or more(20 Hz-20 kHz)
Separation ..... 70 dB or more(20 Hz-20 kHz)
Muted audio level ..... 80 dB or more
Dynamic range ..... 80 dB or more(20 kHz)

# 2. OPERATION

### Pressing the clear button

If the power does not switch on or if the compact disc player does not operate when the button on the multi-CD controller is pressed, or if the multi-CD controller display is incorrect, press this button on the player with the tip of a pencil to restore normal operation. (This button is located inside the door.) Always press the clear button on the multi-CD controller, too, after pressing this button(Fig. 1).

- If the clear button is pressed when the player contains a magazine or the ignition switch is set to the ON or ACC position, the CD title display and ITS memory are cleared.

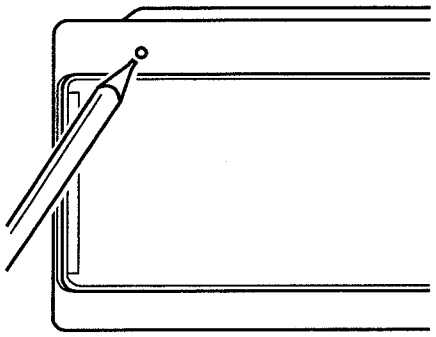
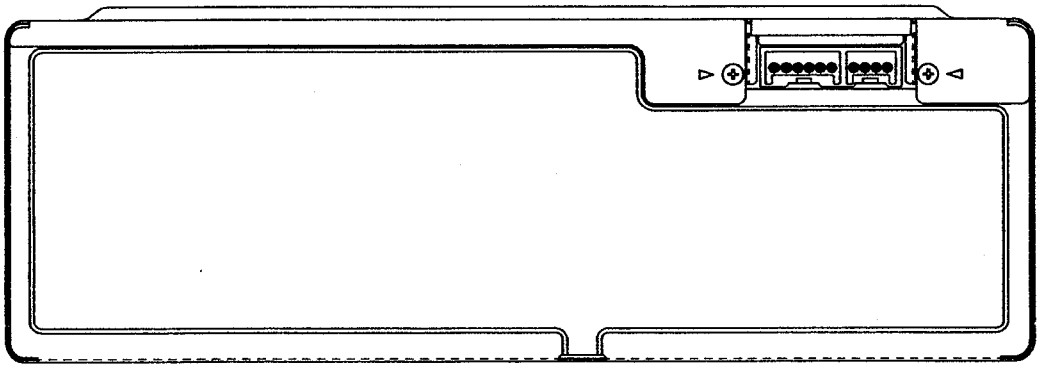


Fig. 1

# 3. CONNECTOR FUNCTION DESCRIPTION



| | | | |
|---|---|---|---|
| 1 | L | 6 | NC |
| 2 | R | 7 | GND |
| 3 | COMMON | 8 | NC |
| 4 | SGND(DRAIN) | 9 | NC |
| 5 | BATT | 10 | BUS(E&C DATA) |

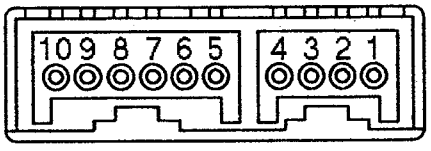



Fig. 2

# 4. DISASSEMBLY

### ● Removing the Two Cases

1. Remove the six screws.
2. Remove the upper case and lower case.

### ● Removing the Grille Assy

1. Press the four tabs indicated by arrows and then pull out the grille assy.

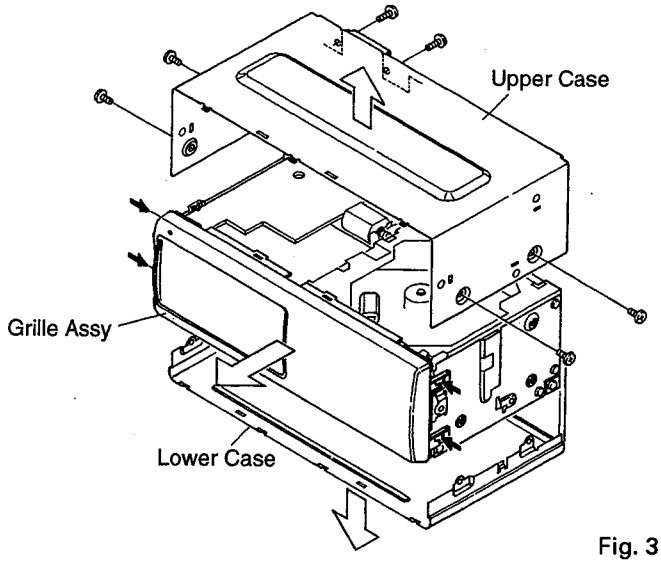



Fig. 3

### ● Removing the Extension P.C.Board

1. Remove the one screw.
2. Unbend the tabs at three locations indicated by arrows until straight.
3. Remove the extension P.C.Board.

### ● Removing the Main Unit

1. Remove the one screw.
2. Unbend the tab at one location indicated by arrow until straight.
3. Remove the main unit.

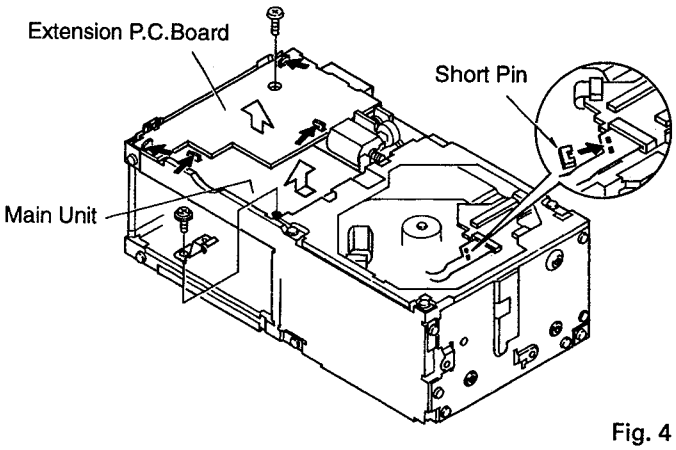



Fig. 4

Before disconnecting the connector(PU unit connector), attach a short pin as illustrated.

# 5. ADJUSTMENT

1)Precautions

· This unit uses a single power supply (+5V) for the regulator. The signal reference potential, therefore, is connected to REFO(approx. 2.5V) instead of GND.
If REFO and GND are connected to each other by mistake during adjustments, not only will it be impossible to measure the potential correctly, but the servo will malfunction and a severe shock will be applied to the pick-up. To avoid this, take special note of the following.
Do not connect the negative probe of the measuring equipment to REFO and GND together. It is especially important not to connect the channel 1 negative probe of the oscilloscope to REFO with the channel 2 negative probe connected to GND.
Since the frame of the measuring instrument is usually at the same potential as the negative probe, change the frame of the measuring instrument to floating status.
If by accident REFO comes in contact with GND, immediately switch the regulator or power OFF.

· Always make sure the regulator is OFF when connecting and disconnecting the various filters and wiring required for measurements.

· Before proceeding to further adjustments and measurements after switching regulator ON, let the player run for about one minute to allow the circuits to stabilize.

· Since the protective systems in the unit's software are rendered inoperative in test mode, be very careful to avoid mechanical and / or electrical shocks to the system when making adjustment.

· Disc detection during loading and eject operations is performed by means of a photo transistor in this unit.Consequently, if the inside of the unit is exposed to a strong light source when the outer casing is removed for repairs or adjustment, the following malfunctions may occur.
*During PLAY, even if the eject button is pressed, the disc will not be ejected and the unit will remain in the PLAY mode.
*The unit will not load a disc.
When the unit malfunctions this way, either re-position the light source, move the unit or cover the photo transistor.

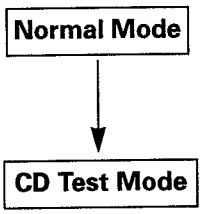
· When loading and unloading discs during adjustment procedures, always wait for the disc to be properly clamped or ejected before pressing another key. Otherwise, there is a risk of the actuator being destroyed.

· Turn power off when pressing the button **FF** or the button **REV** key for focus search in the test mode. (Or else lens may stick and the actuator may be damaged.)

2)Test mode

· This unit is adjusted in a combination with the CD controller tool(CEN-822). Each regulator key should be operated at the tool.
With the CEN-822 taken up for reference, a description will be given below concerning how to enter into the test mode, including key operations. The key in the adjustment text is also one of the CEN-822 keys.

· How to enter into the test mode

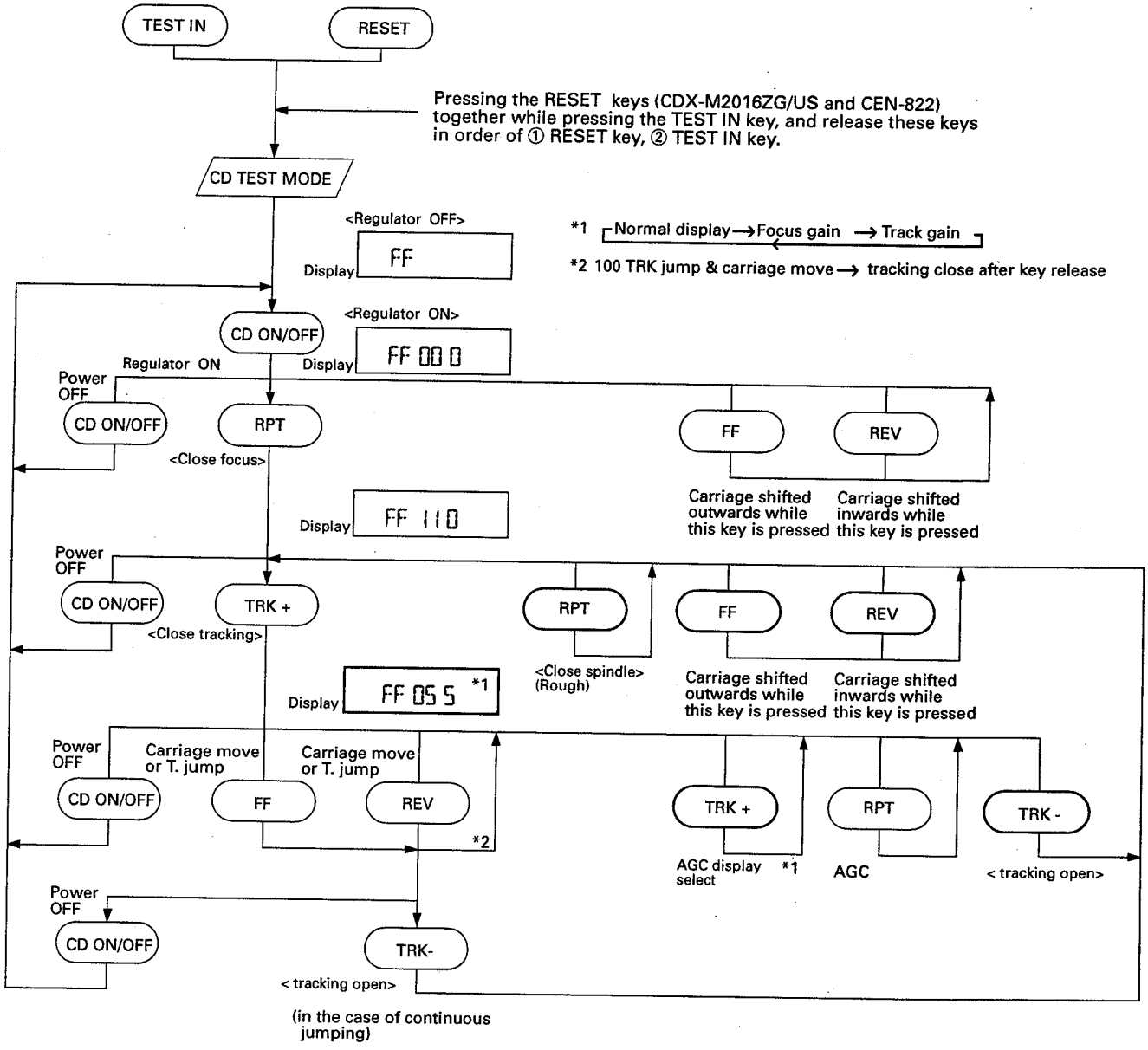



Pressing the RESET keys (CDX-M2016ZG/US and CEN-822) together while pressing the TEST IN key, and release these keys in order of ① RESET key, ② TEST IN key.

· Resetting the test mode
Pressing the RESET keys (CDX-M2016ZG/US and CEN-822) together.

· SINGLE TRK will continue to operate even after the key is released.Tracking is closed the moment C-MOVE is released.

## ● Flow Chart




·DISC change : 1-12 key

## ● Measuring Equipment and Jigs

| Adjustment | Measuring equipment & jigs |
|---|---|
| 1 Tracking Error Offset Adjustment 1 | DC V Meter |
| 2 Grating Check / Adjustment 1 | Oscilloscope, ABEX TCD-784 (or SONY TYPE 4), Two L.P.F., Clock Driver |
| 3 Grating Adjustment 2 | Oscilloscope, Grating Adjustment Filter (B.P.F.), mV Meter, ABEX TCD-784 (or SONY TYPE 4), Two L.P.F., Clock Driver |
| 4 Tracking Balance Adjustment 1 | Oscilloscope, L.P.F., ABEX TCD-784 (or SONY TYPE 4) |
| 5 Focus Bias Adjustment | Oscilloscope, ABEX TCD-784 (or SONY TYPE 4) |
| 6 RFO Offset Adjustment | Oscilloscope, ABEX TCD-784 (or SONY TYPE 4) |
| 7 Tracking Error Offset Adjustment 2 | DC V Meter |
| 8 Tracking Balance Adjustment 2 | Oscilloscope, L.P.F., ABEX TCD-784 (or SONY TYPE 4) |

## ● Adjustment Point and Test Point

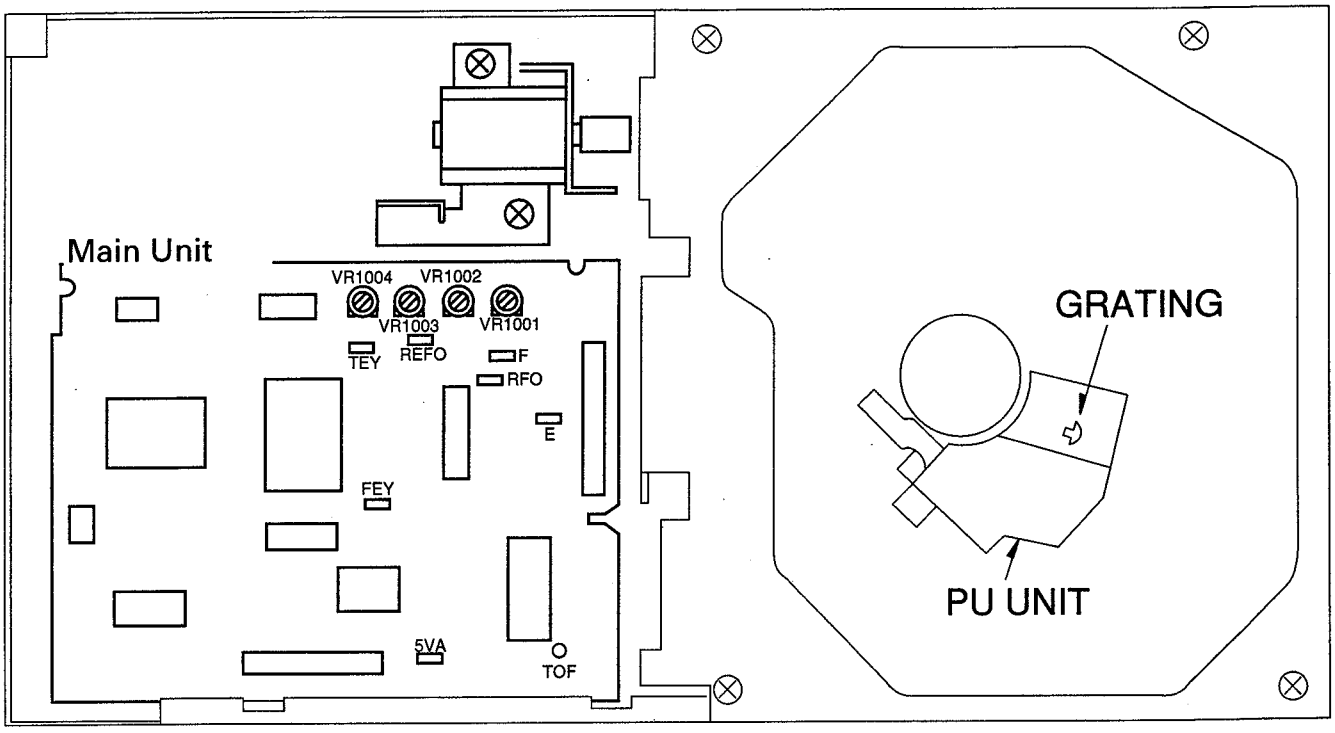



Fig. 5

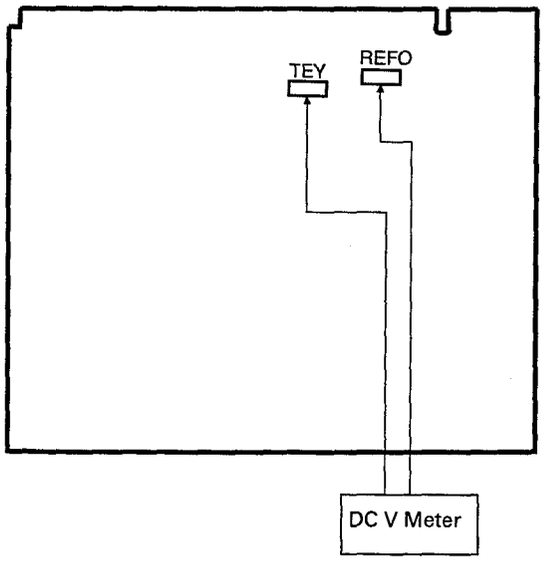
| | |
|---|---|
| VR1001 | TRACKING ERROR OFFSET |
| VR1002 | TRACKING BALANCE |
| VR1003 | FOCUS ERROR BIAS |
| VR1004 | RFO OFFSET |

## 1 Tracking Error Offset Adjustment 1

·**Purpose :**
To adjust the offset of the tracking pre-amp to zero.
·**Symptoms of Mal-adjustment :**
Track search NG, carriage runaway, poor playability.

| | |
|---|---|
| ·**Measuring Equipment / Jig** | ·DC V Meter |
| ·**Measuring Point** | ·TEY |
| ·**Test Disc , Mode** | ·No disc, TEST MODE |
| ·**Adjustment Point** | ·VR1001(TE OFFSET VR) |

Main Unit



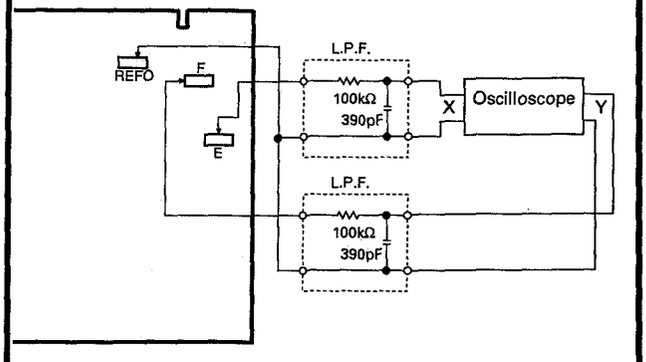

**Adjustment Procedure**
1.Switch the regulator on.
2.Using VR1001 (TE OFFSET) adjust DC voltage of TEY from REFO to 0±25mV.

## 2 Grating Check / Adjustment 1

·**Purpose :**
To check that the PU grating is correctly aligned after the PU unit has been replaced.
·**Symptoms of Mal-adjustment :**
Unable to play disc, track skip during search, search NG.

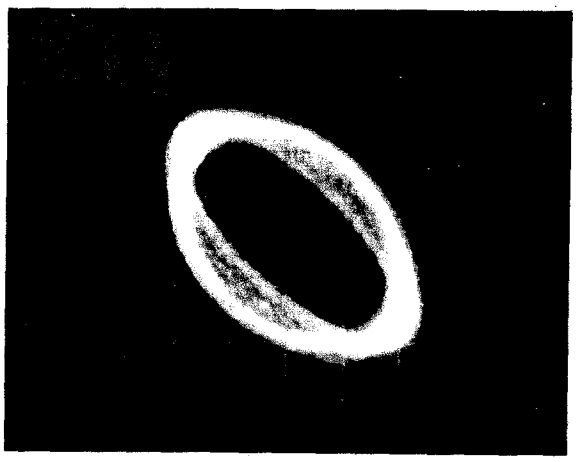
| | |
|---|---|
| ·**Measuring Equipment / Jig** | ·Oscilloscope, Two L.P.F., Clock Driver |
| ·**Measuring Point** | ·E, F |
| ·**Test Disc , Mode** | ·ABEX TCD-784 (or SONY TYPE 4), TEST MODE |
| ·**Adjustment Point** | ·Grating hole |

Main Unit




**Adjustment Procedure**
1.Load disc and switch regulator on.
2.Position the PU unit in the center of the disc using the **REV or FF** keys.
3.Press key **RPT** to close focus and press once more to close spindle.
4.Input the L.P.F. output of E to the X axis, and L.P.F. output of F to the Y axis of an oscilloscope by the AC mode, observe lissajous, and check that the grating is within ±45°. (See Waveform 1–3).
5.If the grating is over 45°, make a fine adjustment by slowly turning the screw driver, so that the lessajous is in line. If, however during the adjustment the screw driver should be turned too much and the lessajous should become out of line, proceed to the next grating adjustment 2.

Lissajous figure (AC input)
Horizontal axis E 10mV/div.
Vertical axis F 10mV/div.

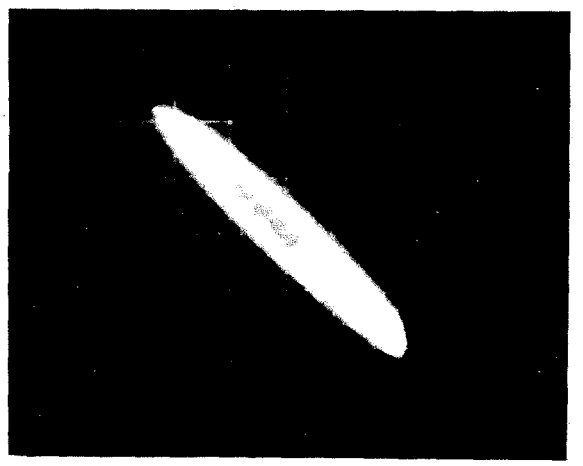


60°=NG

Waveform 1

45°=OK
(Limit)

Waveform 2



0°=BEST
(Doesn't become a single line due to eccentricity)

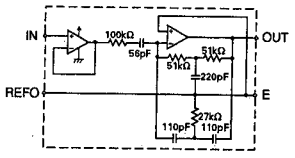
Waveform 3

## 3 Grating Adjustment 2

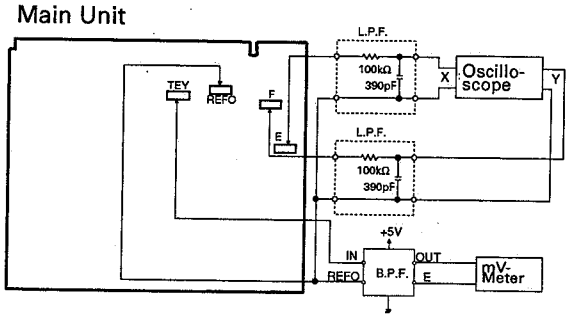
- **Purpose :**
  This needs to be done if the previous adjustment was unsuccessful.
- **Symptoms of Mal-adjustment :**
  Unable to play disc, track skipping, track search NG.

| | |
|---|---|
| **·Measuring Equipment / Jig** | ·Oscilloscope, Grating Adjustment filter (B.P.F.), mV Meter, Two L.P.F., Clock Driver |
| **·Measuring Point** | ·TEY, E, F |
| **·Test Disc , Mode** | ·ABEX TCD-784 (or SONY TYPE 4), TEST MODE |
| **·Adjustment Point** | ·Grating hole |

B.P.F.




Main Unit

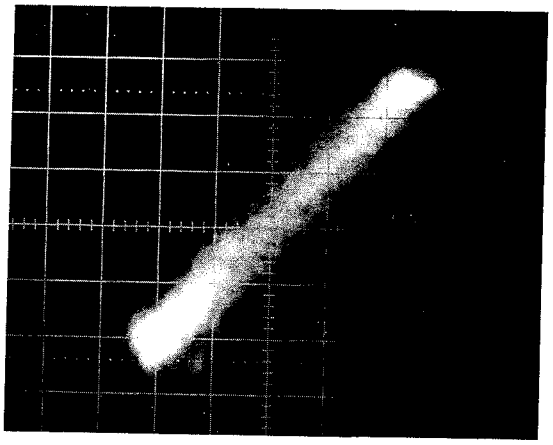



**Adjustment Procedure**

1. Load disc and switch regulator on.
2. Position the PU unit in the center of the disc using the **REV or FF** keys.
3. Press key **RPT** to close focus and press once more to close spindle.
4. While observing the TEY filter output using an ACmV meter, use a screwdriver to slowly turn the grating hole.
   The AC level, should become larger or smaller by turning the grating hole, try to find the minimum level point.
   (This is where the grating is in line on track, and is the "null point".)
5. Turn the screwdriver clockwise from the null point (from the PU under side), so that the lissajous is in line as much as possible.

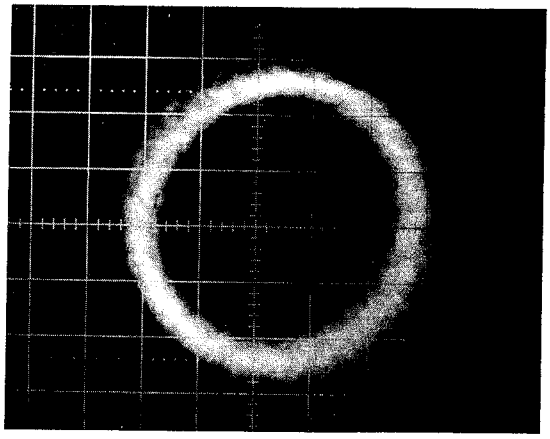
Lissajous figure (AC input)
Horizontal axis E 10mV/div.
Vertical axis F 10mV/div.

Null Point=180°



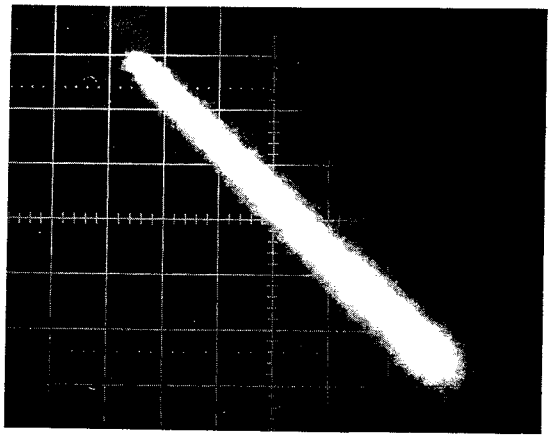
Waveform 4

"Rough" adjustment=90°



Waveform 5

Final adjustment=0°



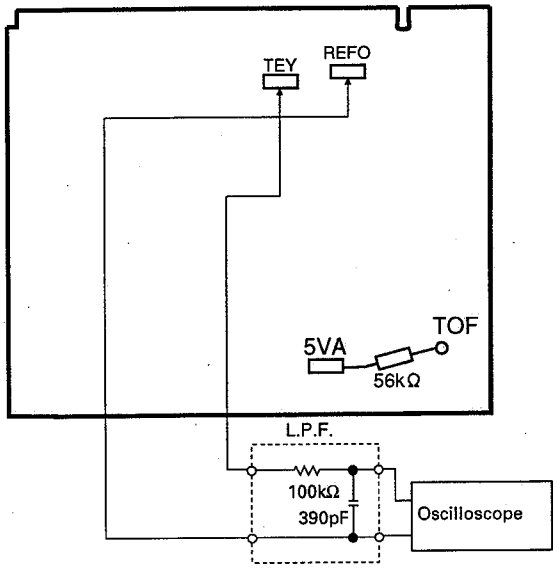
Waveform 6

## 4 Tracking Balance Adjustment 1

- **Purpose :**
  To equate the sensitivity of the F channel to that of the E channel.
- **Symptoms of Mal-adjustment :**
  Track search NG, poor playability, carriage runaway.

| | |
|---|---|
| **Measuring Equipment / Jig** | Oscilloscope, L.P.F. |
| **Measuring Point** | TEY |
| **Test Disc , Mode** | ABEX TCD-784 (or SONY TYPE 4), TEST MODE |
| **Adjustment Point** | VR1002 (T.BAL VR) |

Main Unit




Pull up the TOF terminal to the 5VA terminal with a 56kΩ resistor. (This is in order to cancel lens offset in the tracking direction.)

**Adjustment Procedure**

1. Load disc and switch the regulator on.
2. Position the PU unit in the center of the disc using the **REV or FF** keys.
3. Close focus by pressing key **RPT**.
4. Observing the TEY waveform on the oscilloscope, adjust VR1002 until the positive and negative halves have the same amplitude (see waveform 7–9).

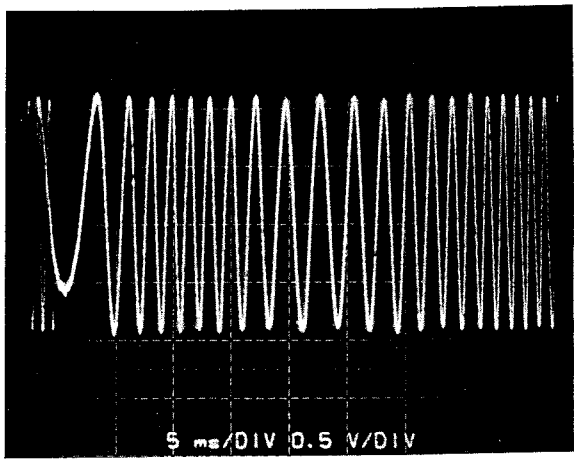
**Check**

After adjustment the TEY waveform should have an amplitude of 1.5±0.65 Vpp (ABEX TCD-784 or SONY TYPE 4)
(Providing focus bias is OK)

DC Mode
0.5V/div.
5ms/div.

+5% NG

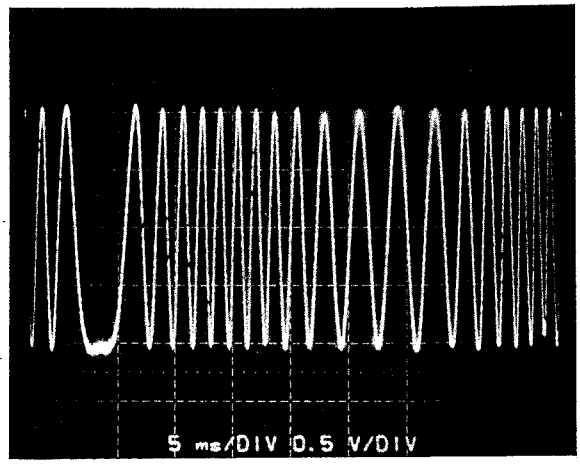
REFO →




Waveform 7

±0% OK

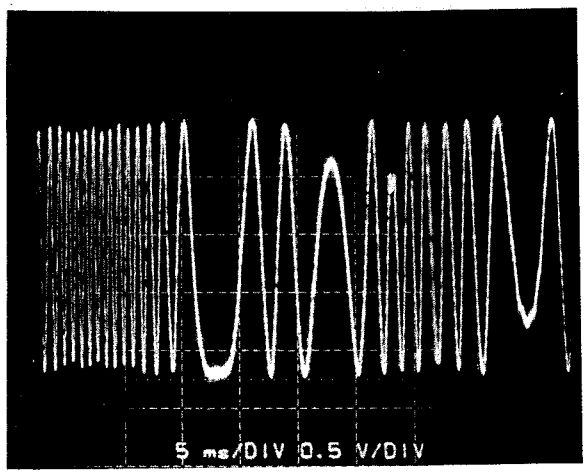
REFO →




Waveform 8

−5% NG

REFO →



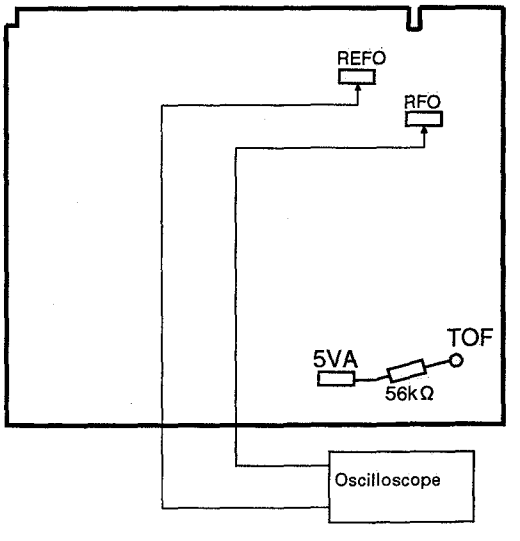

Waveform 9

## 5 Focus Bias Adjustment

· **Purpose :**
To adjust the focus servo reference so that the RF waveform is an optimum.
· **Symptoms of Mal-adjustment :**
Difficulty in closing focus, poor playability.

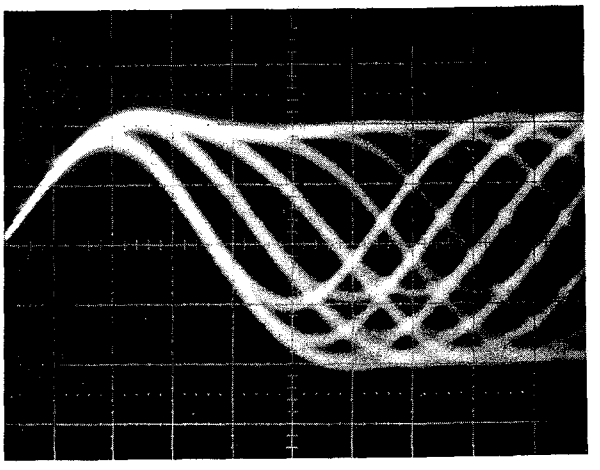
| | |
|---|---|
| · **Measuring Equipment / Jig** | · Oscilloscope |
| · **Measuring Point** | · RFO |
| · **Test Disc , Mode** | · ABEX TCD-784 (or SONY TYPE 4), NORMAL MODE |
| · **Adjustment Point** | · VR1003 (FE BIAS VR) |

Main Unit



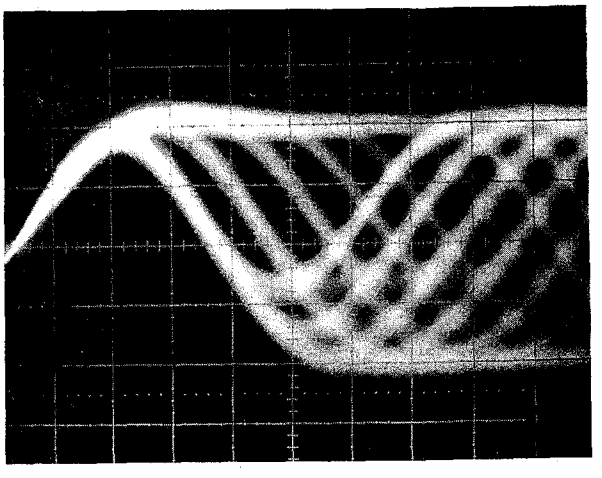

Pull up the TOF terminal to the 5VA terminal with a 56kΩ resistor. (This is in order to cancel lens offset in the tracking direction.)

**Adjustment Procedure**
1.Play track number 18.
2.Observe the RFO from REFO on an oscilloscope, and adjust VR1003 (FE BIAS) so that the RF waveform is maximum and eye pattern is optimum. (See waveform 10, 11)
**Check**
After adjustment the RFO waveform should have an amplitude of 1.7±0.65 Vpp (ABEX TCD-784 or SONY TYPE 4)
3.Remove the pull-up resistor after completing adjustment.



OK

Waveform 10



NG

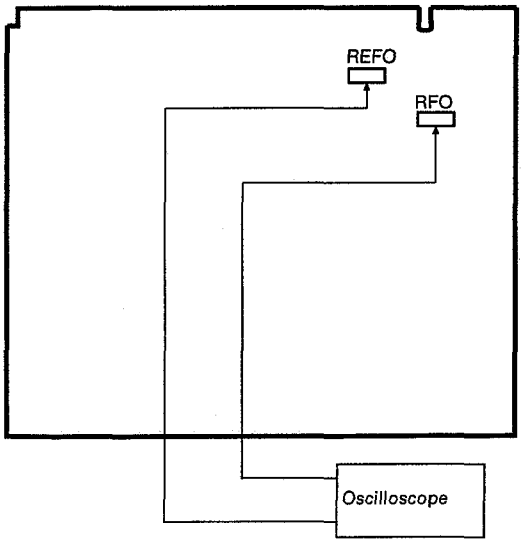
AC Mode Before adjustment Waveform 11

## 6 RFO Offset Adjustment

**·Purpose**
To adjust the RFO waveform offset to an optimum.
**·Symptoms of Mal-adjustment**
Difficulty in closing focus, poor playability.

| | |
|---|---|
| **·Measuring Equipment / Jig** | ·Oscilloscope |
| **·Measuring Point** | ·RFO |
| **·Test Disc , Mode** | ·ABEX TCD-784 (or SONY TYPE 4), NORMAL MODE |
| **·Adjustment Point** | ·VR1004 (RFO OFFSET VR) |

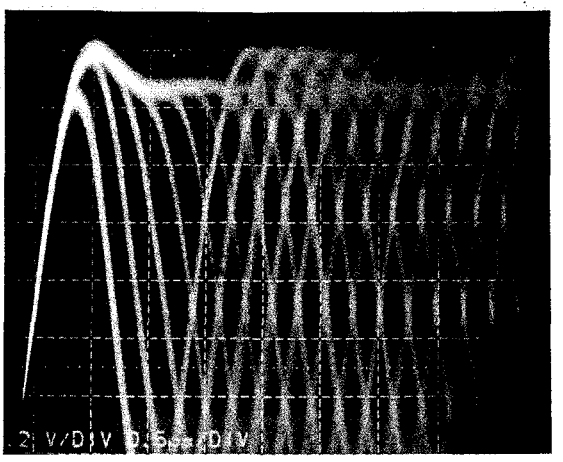
Main Unit




**Adjustment Procedure**
1.Make sure the TOF terminal's pull-up resistor has been disconnected.
2.Play track number 18.
3.Adjust VR1004 so that the peak value of the upper envelope of the RFO waveform is at +1.1VDC w.r.t. REFO (See waveform 12–14).

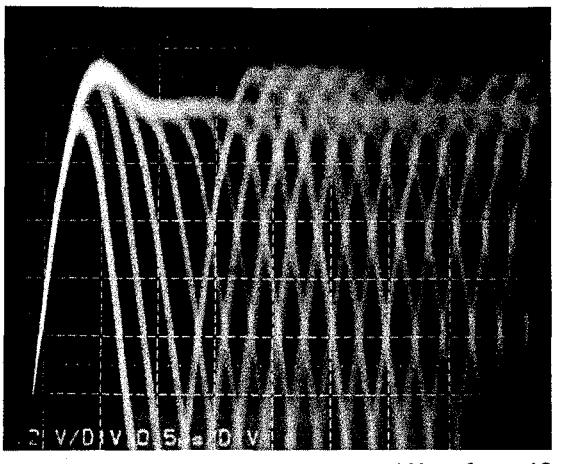
DC Mode
0.2V/div.
0.5µs/div.

+100mV NG



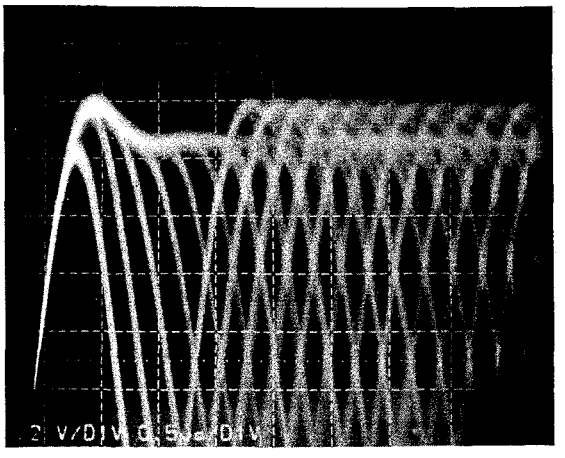

Waveform 12

OK




Waveform 13

-100mV NG



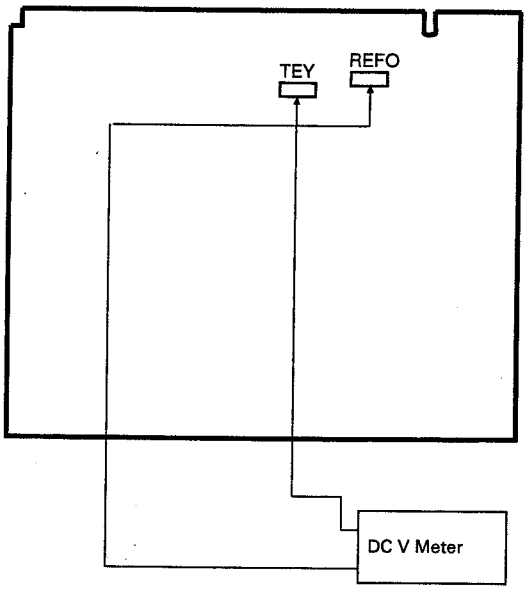

Waveform 14

## 7 Tracking Error Offset Adjustment 2

·**Purpose :**
To check the offset of the tracking pre-amp is zero and adjust if necessary.
·**Symptoms of Mal-adjustment :**
Track search NG, carriage runaway, poor playability.

| | |
|---|---|
| ·**Measuring Equipment / Jig** | ·DC V Meter |
| ·**Measuring Point** | ·TEY |
| ·**Test Disc , Mode** | ·No disc, TEST MODE |
| ·**Adjustment Point** | ·VR1001(TE OFFSET VR) |

Main Unit



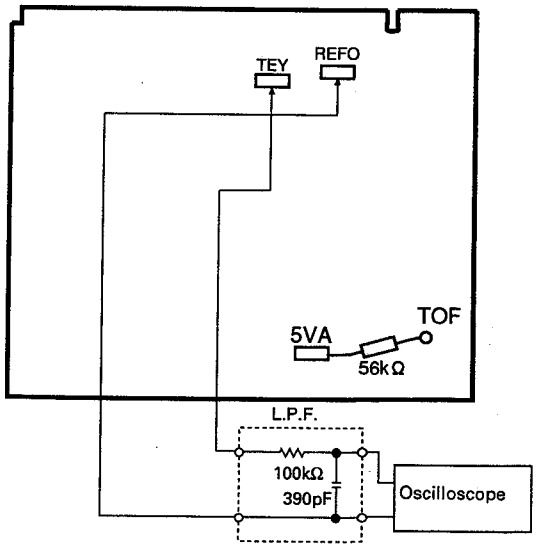

**Adjustment Procedure**
1.Switch the regulator on.
2.Confirm that the DC voltage of TEY from REFO is 0±25mV.
3.If not, readjust and proceed to tracking balance adjustment 2.

## 8 Tracking Balance Adjustment 2

·**Purpose :**
To equate the sensitivity of the F channel to that of the E channel.This needs only be done if the TE OFF-SET volume was re-adjusted in the previous step.
·**Symptoms of Mal-adjustment:**
Track search NG, poor playability, carriage runaway.

| | |
|---|---|
| ·**Measuring Equipment / Jig** | ·Oscilloscope, L.P.F. |
| ·**Measuring Point** | ·TEY |
| ·**Test Disc , Mode** | ·ABEX TCD-784 (or SONY TYPE 4), TEST MODE |
| ·**Adjustment Point** | ·VR1002 (T.BAL VR) |

Main Unit




Pull up the TOF terminal to the 5VA terminal with a 56kΩ resistor. (This is in order to cancel lens offset in the tracking direction.)

**Adjustment Procedure**
1.Load disc and switch the regulator on.
2.Position the PU unit in the center of the disc using the **REV or FF** keys.
3.Close focus by pressing key **RPT.**
4.Observing the TEY waveform on the oscilloscope, adjust VR1002 until the positive and negative halves have the same amplitude (See waveform 7–9).
**Check**
After adjustment the TEY waveform should have an amplitude of 1.5±0.65 Vpp (ABEX TCD-784 or SONY TYPE 4)
5.Remove the pull-up resistor after completing adjustment.

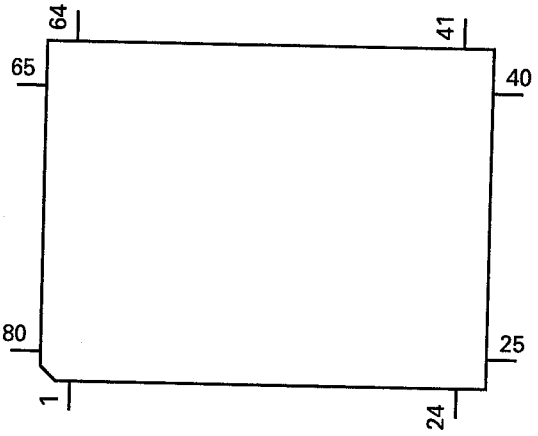
# 6. IC INFORMATION

● **Pin Functions (PD5384A)**

| Pin No. | Pin Name | I/O | Format | Function and Operation |
|---|---|---|---|---|
| 1 | $\overline{\text{TIN}}$ | I | | Disc sensor timing input |
| 2 | NC | | | Not used |
| 3 | VDIN | | | Power supply short sensor |
| 4 | $\overline{\text{CLAMP}}$ | I | | Tray position input |
| 5-7 | NC | | | Not used |
| 8 | AO | O | N | Control signal distinguishing from LSI |
| 9 | XSCK | I/O | N | LSI clock input/output |
| 10 | XSO | O | N | LSI data output |
| 11 | XSI | I | | LSI data input |
| 12 | $\overline{\text{STB}}$ | O | C | LSI strobe output |
| 13 | $\overline{\text{RST}}$ | O | C | LSI reset output |
| 14 | NC | | | Not used |
| 15 | DACRST | O | C | D/A converter reset output |
| 16 | $\overline{\text{CDBSENS}}$ | I | | CD Bsense input (CD) |
| 17 | DONINT | I | | ↓ Edge sense input |
| 18 | DOFINT | I | | ↑ Edge sense input |
| 19 | $\overline{\text{BSENS}}$ | I | | Back up sense input (E&C) |
| 20 | DMUTE | O | C | Digital mute output |
| 21 | $\overline{\text{DOPNSW}}$ | I | | Door keep open switch input |
| 22 | $\overline{\text{DCLSSW}}$ | I | | Door keep close switch input |
| 23 | ECOUT | O | C | E&C Bus data output |
| 24 | $\overline{\text{ECIN}}$ | I | | E&C Bus data intrude input |
| 25 | $\overline{\text{MAG}}$ | I | | Magazine lock switch intrude input |
| 26 | NC | | | Not used |
| 27 | $\overline{\text{RESET}}$ | I | | Reset input |
| 28 | POWER | O | C | CD +5V control |
| 29 | CONT | O | C | Servo driver power supply control |
| 30 | XIN | I | | Crystal oscillating element connection pin |
| 31 | XOUT | O | | Crystal oscillating element connection pin |
| 32 | VSS | | | GND |
| 33-40 | NC | | | Not used |
| 41 | MUTEP | O | C | MUTE output for audio MUTE |
| 42 | AUDOUT | O | C | AUDIO bus connection control |
| 43 | DET | O | C | Watchdog reset pulse output |
| 44 | WD1 | O | C | Watchdog power supply control output |
| 45 | WD2 | O | C | Watchdog reset pulse mask |
| 46 | SWD | O | C | BATT detect circuit ON/OFF |
| 47 | DORILM | O | C | Door illumination output |
| 48 | NC | | | Not used |
| 49 | PEEOUT | O | C | Test tone circuit connect/unconnect |
| 50 | NC | | | Not used |
| 51 | ECKO | O | C | E-bit check output |
| 52 | ECKI | I | | E-bit check input |
| 53 | DCE | O | C | Compression CE |
| 54 | DRST | O | C | Compression IC reset output |
| 55,56 | NC | | | Not used |
| 57 | $\overline{\text{EJP}}$ | I | | Reset position switch |
| 58,59 | NC | | | Not used |
| 60 | MIRR | I | | Mirror detector input |
| 61 | LOCK | I | | Spindle lock detector input |
| 62 | FOK | I | | FOK signal input |
| 63 | $\overline{\text{HOME}}$ | I | | Home position detector input |
| 64 | NC | | | Not used |
| 65 | LOAD | O | C | Mechanism power supply control |

| Pin No. | Pin Name | I/O | Format | Function and Operation |
|---|---|---|---|---|
| 66 | I3 | O | C | Motor driver control output |
| 67 | I1 | O | C | Motor driver control output |
| 68 | I2 | O | C | Motor driver control output |
| 69 | I4 | O | C | Motor driver control output |
| 70 | CDMUTE | O | C | CD mute output |
| 71 | $\overline{\text{ADENA}}$ | O | C | A/D reference voltage output |
| 72 | $\overline{\text{TESTIN}}$ | I | | Test program mode input |
| 73 | VCC | | | Back up 5V |
| 74 | VREF | I | | A/D converter reference voltage input |
| 75 | AVSS | | | A/D GND |
| 76,77 | NC | | | Not used |
| 78 | $\overline{\text{DISK}}$ | | | Disc detector , 8/12cm detect |
| 79 | $\overline{\text{TSEL}}$ | | | Tray position detector photo sensor |
| 80 | SMUTE | O | C | DAC soft mute output |

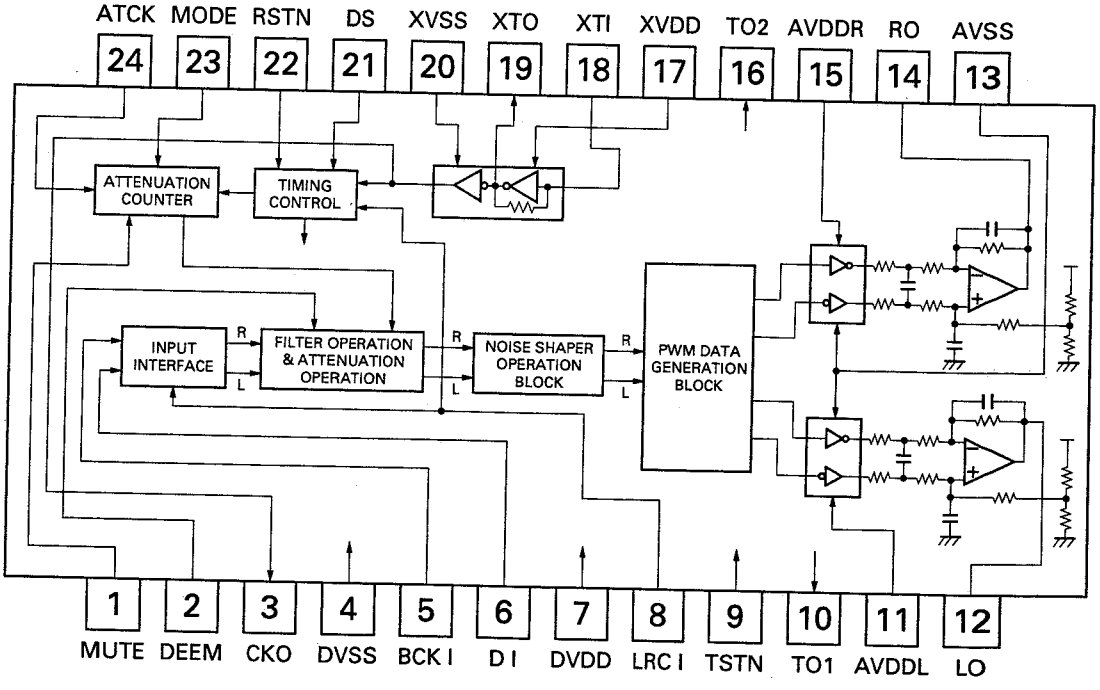
*PD5384A




*IC's marked by* are MOS type.*
*Be careful in handling them because they are very liable to be damaged by electrostatic induction.*

| Format | Meaning |
|---|---|
| C | C MOS |
| N | N channel open drain |

SM5875AMP


ATCK MODE RSTN DS XVSS XTO XTI XVDD TO2 AVDDR RO AVSS
24 23 22 21 20 19 18 17 16 15 14 13
ATTENUATION COUNTER
TIMING CONTROL
INPUT INTERFACE
FILTER OPERATION & ATTENUATION OPERATION
NOISE SHAPER OPERATION BLOCK
PWM DATA GENERATION BLOCK
R
L
1 2 3 4 5 6 7 8 9 10 11 12
MUTE DEEM CKO DVSS BCK I D I DVDD LRC I TSTN TO1 AVDDL LO

# 7. ELECTRICAL PARTS LIST

**NOTES:**

- Parts whose parts numbers are omitted are subject to being not supplied.
- The part numbers shown below indicate chip components.

Chip Resistor

RS1/○S○○○J,RS1/○○S○○○J

Chip Capacitor (except for CQS.....)

CKS....., CCS....., CSZS.....

| =====Circuit Symbol & No. Part Name===== | | Part No. |
|---|---|---|
| Unit Number : CWX1868 | | |
| Unit Name : Main Unit | | |
| MISCELLANEOUS | | |
| IC 1001 | | UPC2571GS |
| IC 1201 | | UPD63700GF1 |
| IC 1301 | | PD4501A |
| IC 1401 | | XRA6797FP |
| IC 1601 | | SM5875AMP |
| IC 1603 | | NJM78L05A |
| IC 1701 | | PD5384A |
| IC 1703 | | A2470L |
| IC 1704 | | PAJ001A |
| IC 1705 | | PA0054AM |
| IC 1801 | | LB1836M |
| Q 1001 | | 2SA1015 |
| Q 1401 | | 2SB1238 |
| Q 1701 | | DTA144ES |
| Q 1707 1801 | | DTA123JS |
| Q 1708 1802 | | DTC114YS |
| Q 1709 1712 | | 2SA1036K |
| Q 1713 1716 1717 | | UN2211 |
| Q 1714 | | 2SD601A |
| Q 1715 | | UN2111 |
| D 1401 1402 1403 | | ERA15-02VH |
| D 1704 | | MA151WA |
| D 1705 | | MA153 |
| L 1601 | Inductor | LCTB100K3216 |
| L 1602 | Inductor | CTF1357 |
| L 1701 | Coil | LCTB150K3216 |
| X 1601 | Crystal Resonator 16.9340MHz | CSS1328 |
| X 1701 | Ceramic Resonator 8.000MHz | CSS1107 |
| VR1001 | Semi-fixed 2.2kΩ(B) | CCP1177 |
| VR1002 | Semi-fixed 22kΩ(B) | CCP1183 |
| VR1003 1004 | Semi-fixed 47kΩ(B) | CCP1185 |
| | Checker Chip | CKF1031 |
| RESISTORS | | |
| R 1001 | | RS1/8S120J |
| R 1002 | | RS1/8S100J |
| R 1003 1041 1411 1620 1702 1748 1754 1772 1785 1792 | | RS1/16S103J |
| R 1004 1013 1017 1024 1025 1034 1035 1039 1040 1303 | | RS1/16S102J |
| R 1005 1405 | | RS1/16S823J |
| R 1006 | | RS1/16S182J |
| R 1007 | | RS1/16S333J |
| R 1011 1012 | | RS1/16S683J |
| R 1014 1410 1777 | | RS1/16S473J |
| R 1018 1020 | | RS1/16S622J |
| R 1019 1401 1716 | | RS1/16S563J |
| R 1021 | | RS1/16S513J |
| R 1022 1029 1030 1409 | | RS1/16S133J |
| R 1027 | | RS1/16S183J |
| R 1028 | | RS1/16S822J |

| =====Circuit Symbol & No. Part Name===== | | Part No. |
|---|---|---|
| R 1031 1032 1402 1403 | | RS1/16S153J |
| R 1036 1037 1038 1301 1413 | | RS1/16S221J |
| R 1042 1709 1710 1714 1722 1733 1734 1735 1744 1745 | | RS1/16S222J |
| R 1201 1407 1705 1713 1718 1731 1775 1783 1789 | | RS1/16S104J |
| R 1302 | | RS1/16S472J |
| R 1404 | | RS1/16S134J |
| R 1406 | | RS1/16S203J |
| R 1408 | | RS1/16S123J |
| R 1412 | | RS1/16S152J |
| R 1414 | | RS1/16S821J |
| R 1601 | | RS1/16S681J |
| R 1605 1606 | | RS1/16S331J |
| R 1621 | | RS1/16S104J |
| R 1703 | | RS1/16S221J |
| R 1704 | | RS1/16S154J |
| R 1708 | | RS1/16S432J |
| R 1712 1755 1756 1776 1788 1793 | | RS1/16S102J |
| R 1721 1730 1732 1773 | | RS1/16S105J |
| R 1774 | | RS1/16S474J |
| R 1779 1782 | | RS1/16S2003F |
| R 1780 | | RS1/16S823J |
| R 1781 | | RS1/16S823F |
| R 1786 | | RS1/10S105J |
| R 1787 | | RS1/10S514J |
| R 1801 1802 | | RS1/10S241J |
| R 1803 1804 | | RS1/10S151J |
| CAPACITORS | | |
| C 1001 1008 1010 1011 | | CKSRYB102K50 |
| C 1002 | | CEAS101M10 |
| C 1003 1021 | | CKSQYB104K25 |
| C 1004 | | CEAS470M10 |
| C 1005 | | CCSRCH101J50 |
| C 1006 1023 | | CKSRYB561K50 |
| C 1007 1015 1201 | | CKSQYB334K16 |
| C 1009 | | CCSRCH181J50 |
| C 1013 1301 1617 1618 1702 1704 1705 1708 1709 | | CKSRYB103K50 |
| C 1014 | | CCSRCH220J50 |
| C 1016 1017 | | CKSQYB104K25 |
| C 1018 | | CKSQYB334K16 |
| C 1022 | | CKSRYB332K50 |
| C 1202 | | CKSQYB104K16 |
| C 1203 | | CCSRCH471J50 |
| C 1302 | | CEA470M6R3LL |
| C 1401 1710 1711 | | CSZA220M10 |
| C 1402 | | CKSQYB562K50 |
| C 1403 | | CKSQYB822K50 |
| C 1404 1405 | | CEAS221M10 |
| C 1406 | | CKSRYB821K50 |
| C 1407 | | CKSRYB471K50 |
| C 1408 | | CCSRCH271J50 |
| C 1409 | 22µF/16V | CCL1044 |
| C 1602 1603 1604 1605 | | CKSQYB104K25 |

| =====Circuit Symbol & No. Part | Name===== | Part No. |
|---|---|---|
| C 1606 1607 | | CCSRCH150J50 |
| C 1608 | | CEA101M6R3LL |
| C 1609 1610 | | CKSRYB682K50 |
| C 1701 | | CKSRYB473K16 |
| C 1703 | | CEA2R2M50LL |
| C 1802 | | CEA220M16LL |

| Extension Unit |
|---|
| Consists of<br>· Extension P.C.Board<br>· Switch P.C.Board |

Unit Number :
Unit Name : Extension Unit

MISCELLANEOUS

| | | |
|---|---|---|
| IC 1101 | | XRA4560F |
| IC 1103 | | TC74HC4053AF |
| Q 103 104 | | 2SD1048 |
| Q 1105 1107 | | UN2211 |
| Q 1106 | | UN2111 |
| Q 1110 | | 2SD1048 |
| Q 1501 | | 2SB942 |
| Q 1502 1503 | | 2SD1859 |
| D 1101 | | RD4R7M |
| D 1102 1103 | | MA151WK |
| D 1105 | | MA151WA |
| D 1107 | | RD18MB1 |
| D 1501 | | SM-3-02LFEA |
| D 1502 | | ERA15-02VH |
| L 101 102 | Inductor | LCTB6R8K3216 |
| L 1102 | Inductor | LCTB6R8K3216 |
| L 1501 | Choke Coil 1.4mH | CTH1129 |
| S 1101 | Switch (Reset) | CSG1053 |
| S 1703 | Switch(Open) | CSN1012 |
| S 1704 | Switch(Close) | CSN1025 |
| IL 1701 | Lamp 14V/65mA | CEL1350 |
| EF 101 102 | EMI Filter | CCG1067 |
| EF1102 | EMI Filter | CCG1067 |

RESISTORS

| | |
|---|---|
| R 107 108 1112 | RS1/10S104J |
| R 109 110 111 112 1121 1504 | RS1/10S103J |
| R 113 114 | RS1/8S151J |
| R 115 116 | RS1/10S222J |
| R 117 118 | RS1/10S164J |
| R 1109 1115 | RS1/10S102J |
| R 1110 1111 | RS1/10S224J |
| R 1113 1114 | RS1/10S105J |
| R 1119 | RS1/10S154J |
| R 1503 1505 | RS1/8S201J |
| R 1506 | RS1/8S241J |
| R 1507 | RS1/10S681J |
| R 1508 | RS1/10S511J |

CAPACITORS

| | | |
|---|---|---|
| C 103 104 1108 | | CEA100M16LL |
| C 105 106 | | CCSQCH471J50 |
| C 107 108 | | CCSQCH221J50 |
| C 109 110 | | CEA220M10LL |
| C 111 112 | | CEA220M16LL |
| C 1106 | 47000µF/5.5V | CCL1015 |
| C 1109 1113 1118 1120 | | CKSQYB103K50 |
| C 1111 | | CEA220M16LL |
| C 1119 | | CCSQCH391J50 |
| C 1121 1122 1508 | 470µF/16V | CCH1183 |
| C 1501 | | CEA220M10LL |
| C 1509 | | CKCYB102K50 |

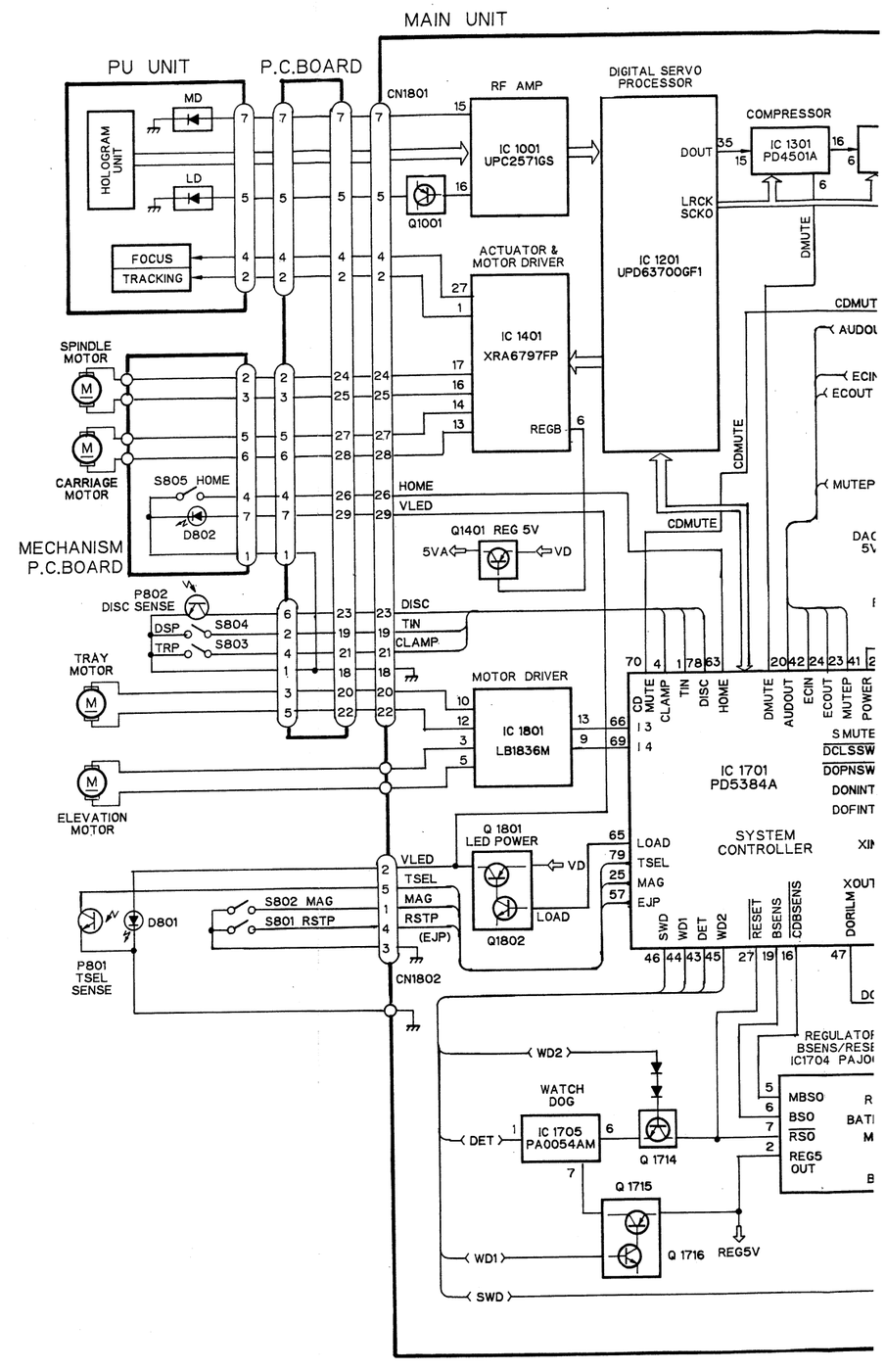
| =====Circuit Symbol & No. Part | Name===== | Part No. |
|---|---|---|
| Unit Number : | | |
| Unit Name | : P.C.Board | |
| C 801 802 | | CKSQYB102K50 |
| Unit Number : | | |
| Unit Name | : Mechanism P.C.Board | |
| D 802 | LED | BR4361F |
| S 805 | Switch(Home) | CSN1012 |

MISCELLANEOUS

| | | |
|---|---|---|
| D 801 | LED | BR4361F |
| S 801 | Switch(RSTP) | CSN1025 |
| S 802 | Switch(MAG) | CSN1012 |
| | PU Unit | CGY1036 |
| M 801 | Motor Unit(Spindle) | CXA8217 |
| M 802 | Motor Unit(ELV) | CXA7272 |
| M 803 | Motor Unit(Tray) | CXA6977 |
| M 804 | Motor Unit(Carriage) | CXA4649 |
| P 801 802 | Photo-Transistor | PT4800 |
| S 803 804 | Switch(TRP,DSP) | CSN1012 |



# 8. BLOCK DIAGRAM



No.

)YB102K50

61F
012

51F
025
012
036
217

272
977
649
)0
012

# 8. BLOCK DIAGRAM

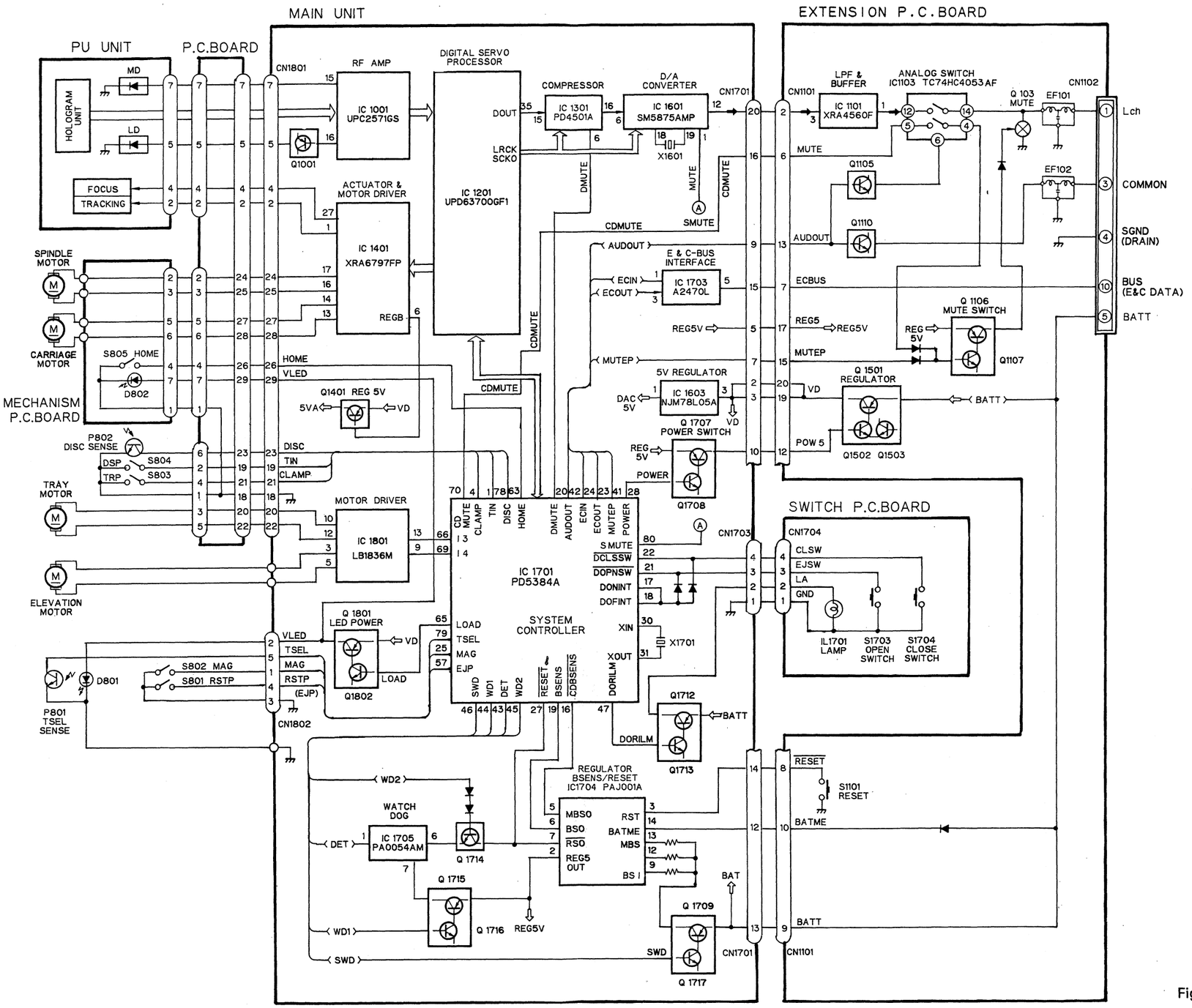
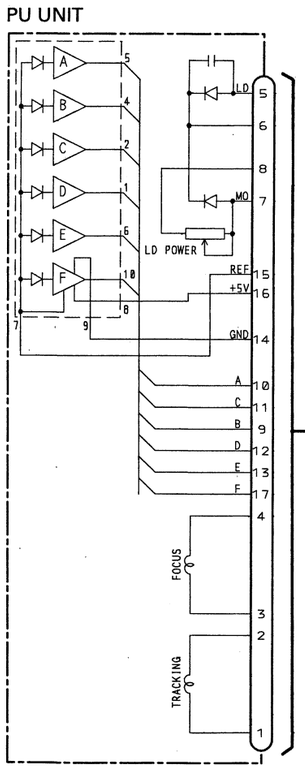
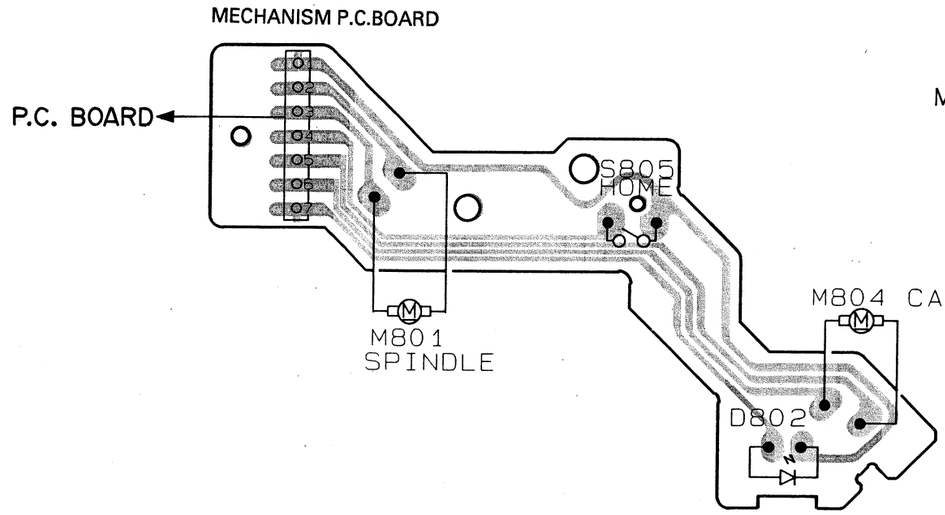
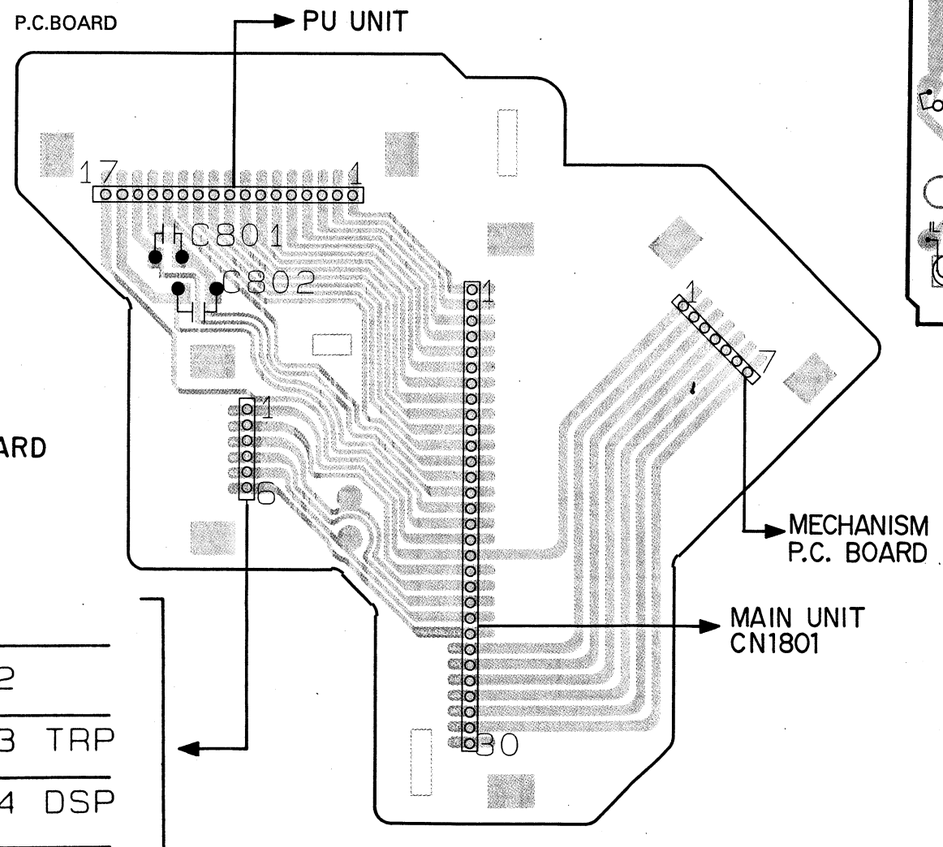


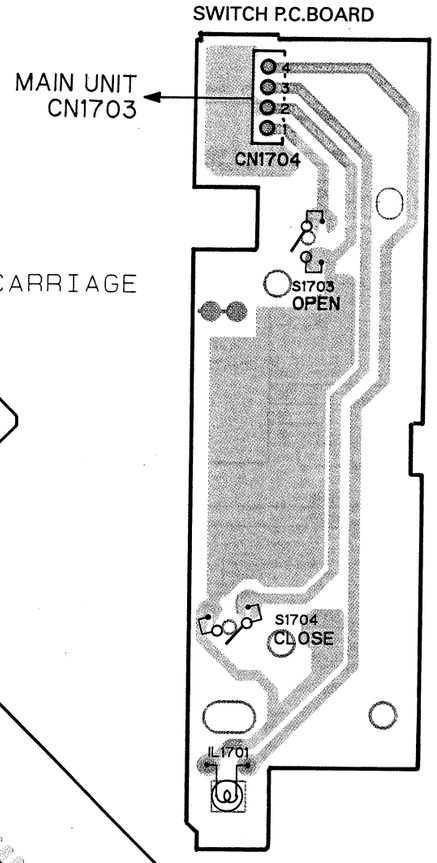

Fig. 6

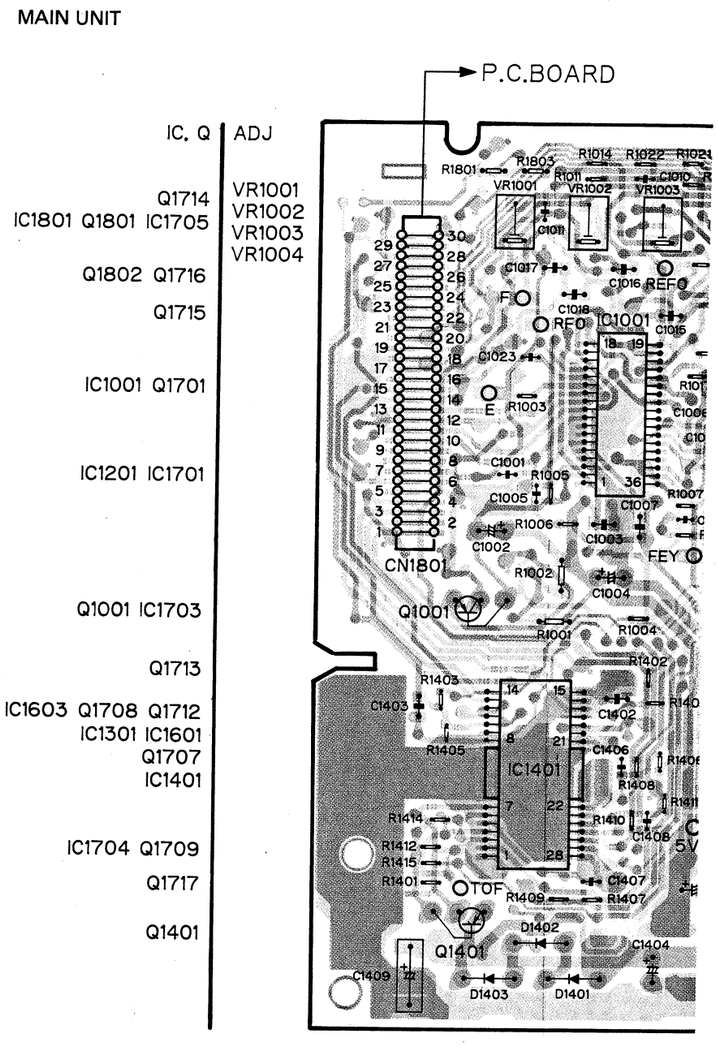
## 9. CONNECTION DIAGRAM



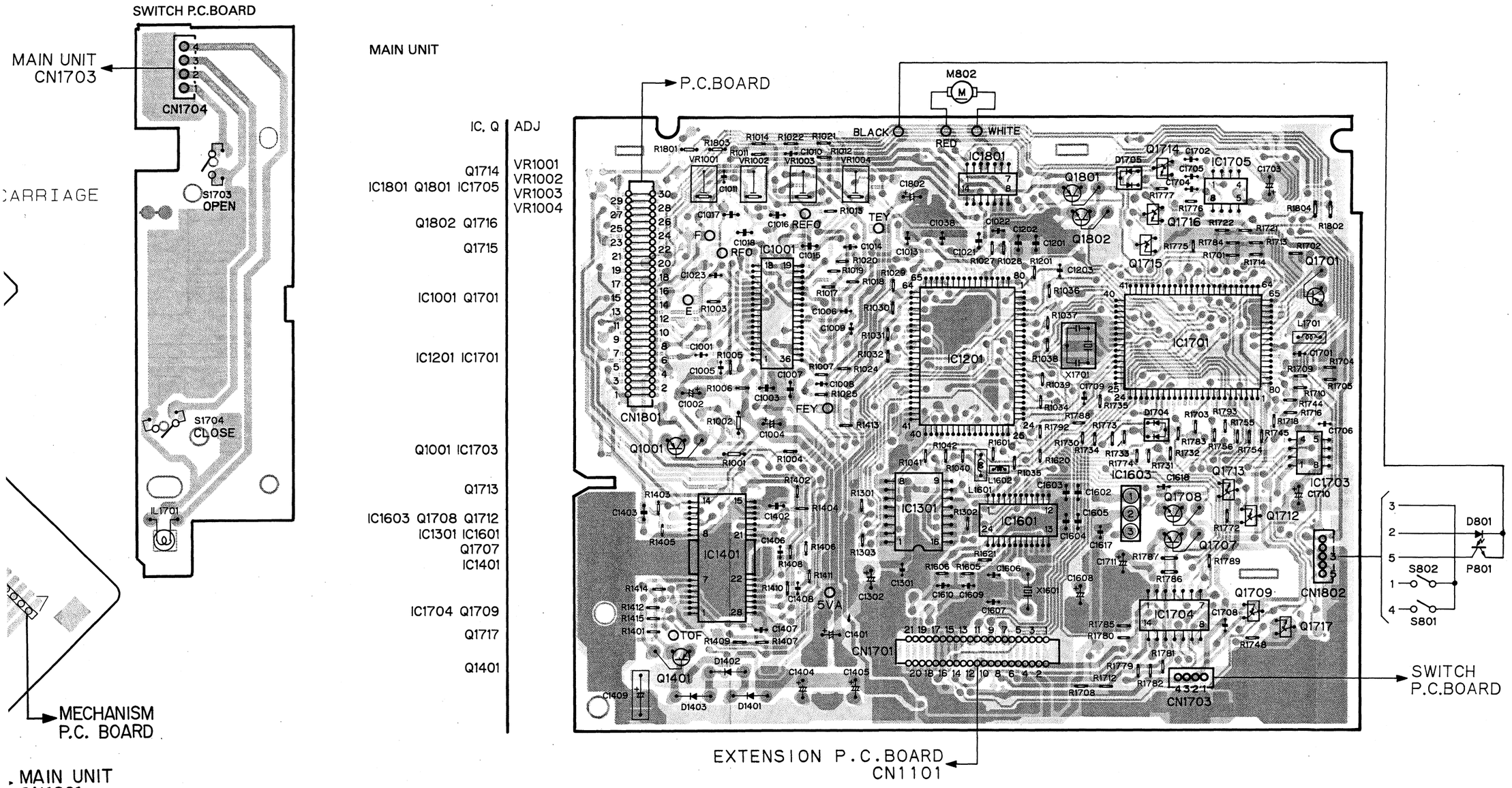




EXTENSION

NOTE:
The parts
For further

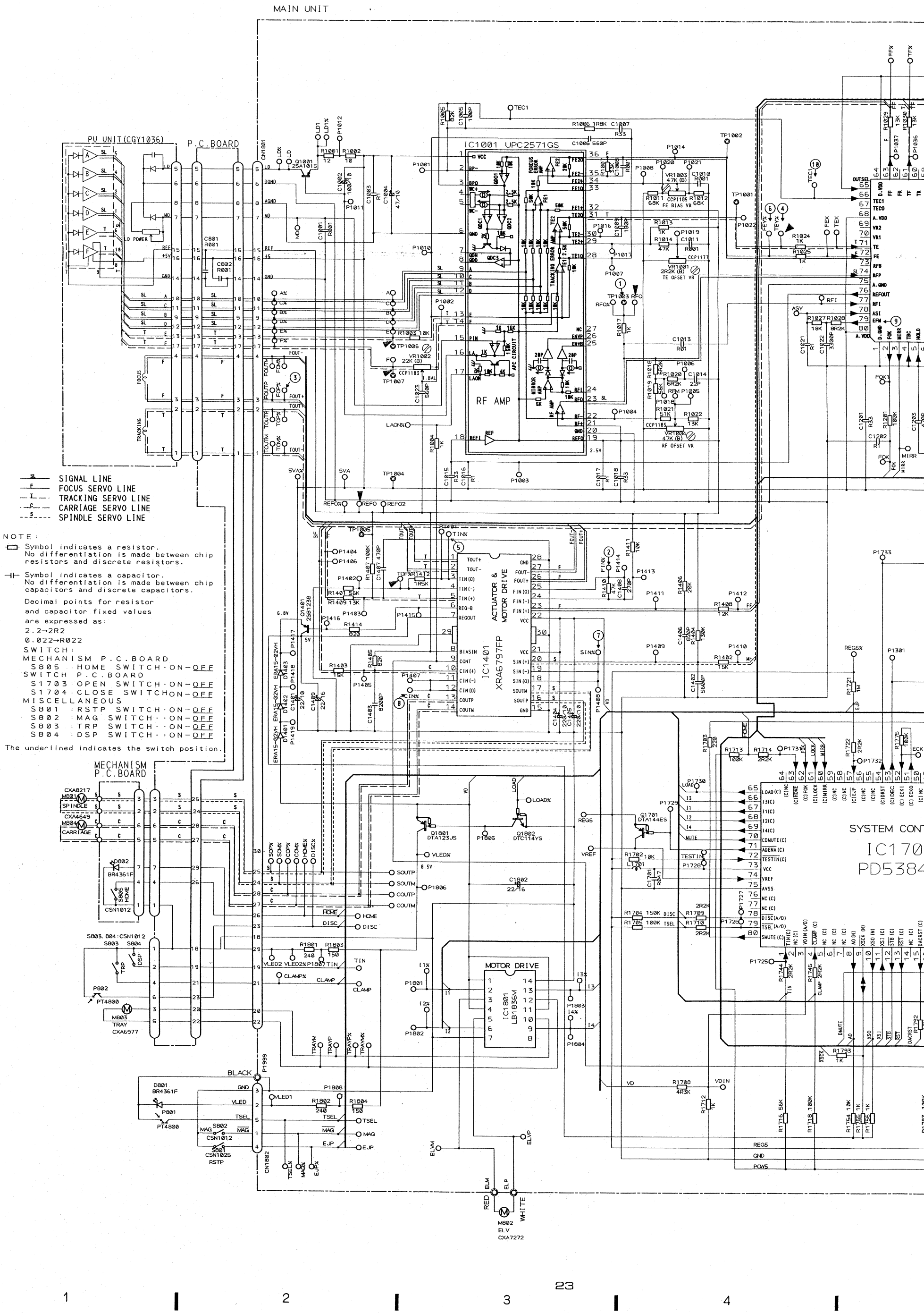



**NOTE:**

The parts mounted on this PCB include all necessary parts for several destinations.
For further information for respective destinations, be sure to check with the schematic diagram.

Fig. 7

# 10. SCHEMATIC CIRCUIT DIAGRAM



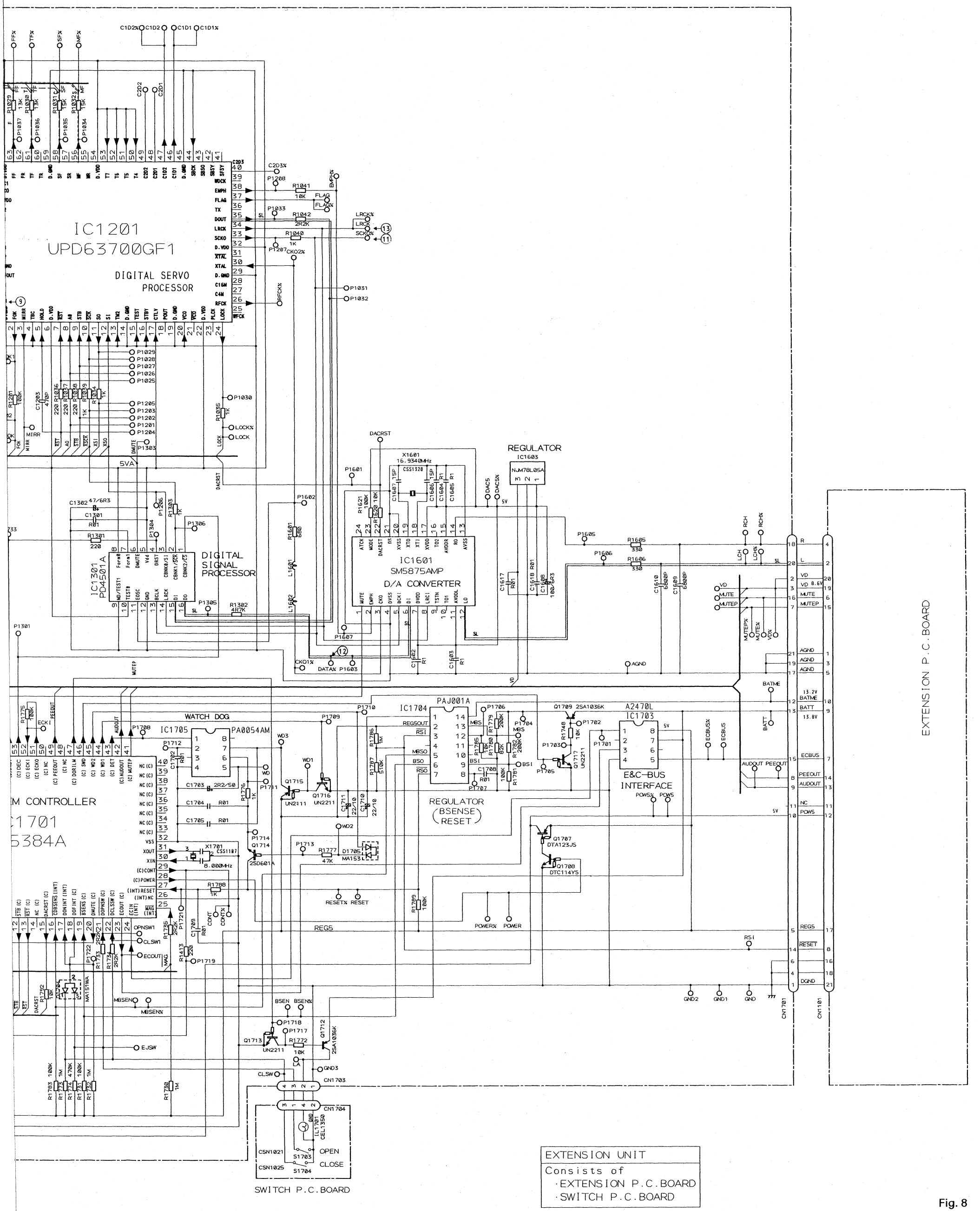

IC1201
UPD63700GF1
DIGITAL SERVO PROCESSOR
IC1301
PD4501A
DIGITAL SIGNAL PROCESSOR
IC1601
SM5875AMP
D/A CONVERTER
REGULATOR
IC1603
NJM78L05A
X1601
16.9340MHz
CSS1328
DACRST
5VA
WATCH DOG
IC1705
PA0054AM
IC1704
PAJ001A
REGULATOR
(BSENSE)
RESET
IC1703
A2470L
E&C-BUS
INTERFACE
EXTENSION P.C.BOARD
SWITCH P.C.BOARD
CN1701
CN1101
CN1703
CN1704
X1701
8.000MHz
CSS1187
Q1715
UN2211
Q1716
UN2211
Q1714
2SD601A
Q1707
DTA123JS
Q1708
DTC114YS
Q1709
2SA1036K
Q1717
UN2211
Q1712
2SA1036K
Q1713
UN2211
D1705
MA153
D1701
MA151WA
S1703
S1704
CEL1350
EXTENSION UNIT
Consists of
·EXTENSION P.C.BOARD
·SWITCH P.C.BOARD

Fig. 8

# 11. CIRCUIT DIAGRAM AND PATTERN

## 11.1 EXTENSION P.C.BOARD

● **Circuit Diagram**

EXTENSION P.C.BOARD

MAIN UNIT CN1701

CN1101

AGND 1 3 5

LCH 2

MUTE 6

REG5 17

RCH 4

POW5 12

BATT 9

BATME 10

VD 19 20

AUDOUT 13

PEEOUT 14

ECBUS 7

MUTEP 15

RESET 8

DGND 16 18 21

GND2 L1 L2 MUTE P25 R1 R2 BATME RST GND3

5.0V 4.4V 8.6V

LPF&BUFFER IC1101 XRA4560F

IC1103 TC74HC4053AF ANALOG SWICH

REGULATOR

D1502 ERA15-02VH

D1102 MA151WK

D1103 MA151WK

D1105 MA151WA

Q1105 UN2211

Q1106 UN2111

Q1107 UN2211

Q1501 2SB942

Q1502 2SD1859

Q1503 2SD1859

Q1108 2SD1848

Q1109 2SD1848

Q1104 2SD1848

MUTE

EMI FILTER

CN1102 L R COMMON SGND (DRAIN) BATT GND BUS (E&C DATA)

L1501 1.4mH

S1101 RESET SWITCH CSG1053

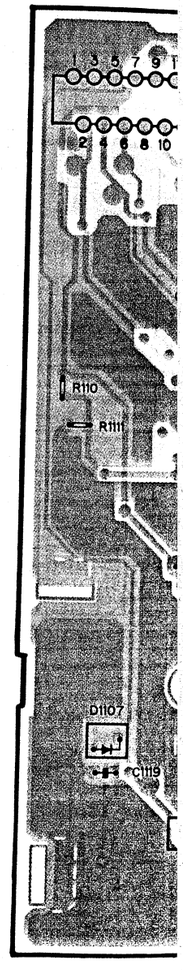




Fig. 9

● **Connection**

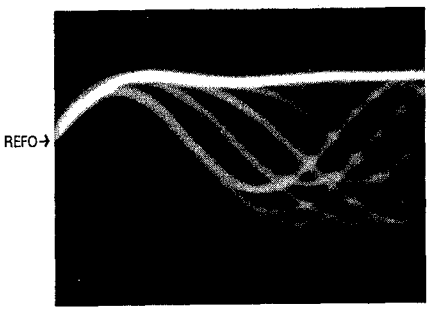
NOTE:
The parts mou
parts for sever
For further inf
sure to check v



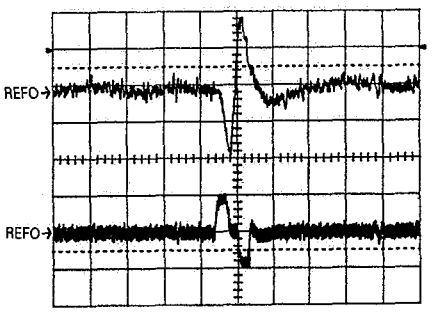
Note: 1. The encircled numbers denote measuring pointes in the circuit diagram.
2. Reference voltage
REFO: 2.5V

## ● Waveforms

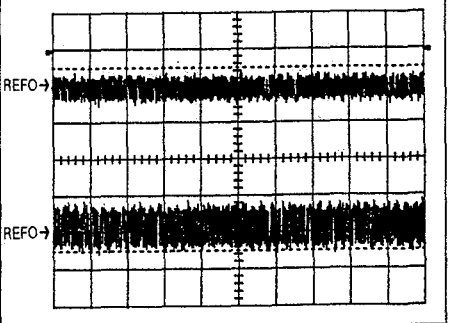
① RFO 0.5V/div. 0.2µs/div.
Normal mode: play



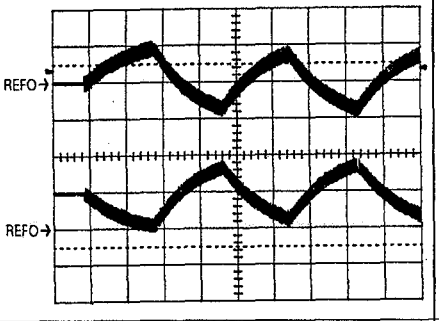

④ CH1: TEY 0.5V/div. 0.5ms/div.
⑤ CH2: TIN 1V/div.
Test mode: Single jump (FWD)



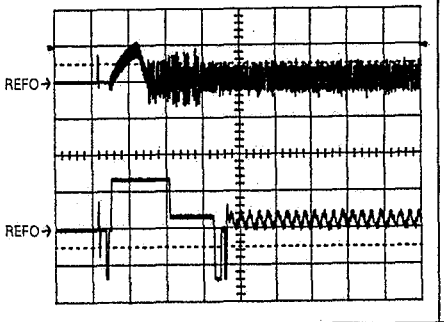

④ CH1: TEY 0.5V/div. 20ms/div.
⑤ CH2: TIN 0.5V/div.
Normal mode: Play



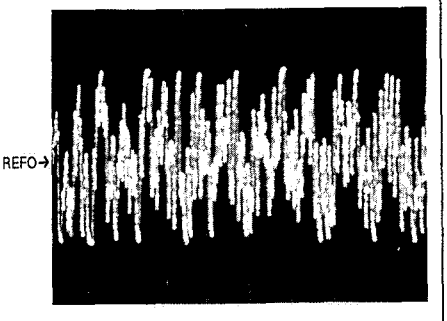

② CH1: FIN 1V/div. 0.2s/div.
③ CH2: FO+ 2V/div.
Test mode: No disc, Focus close



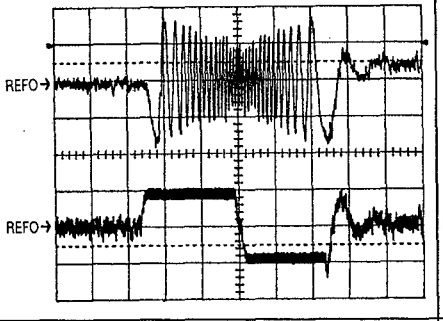

② CH1: FIN 1V/div. 0.5s/div.
⑦ CH2: SIN 1V/div.
Normal mode: Focus close (12cm)



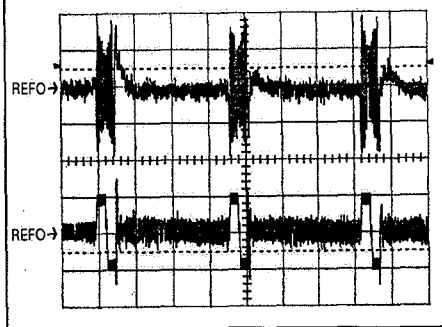

⑦ SIN 0.5V/div. 10ms/div.
Search (12cm disc)



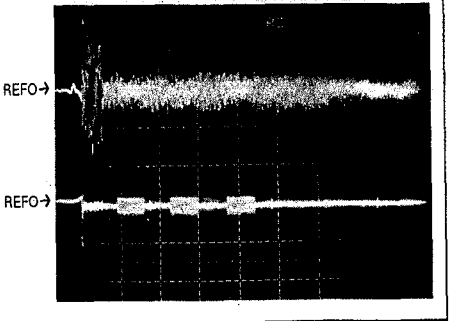

④ CH1: TEY 0.5V/div. 0.5ms/div.
⑤ CH2: TIN 1V/div.
Test mode: 32 track jump (FWD)



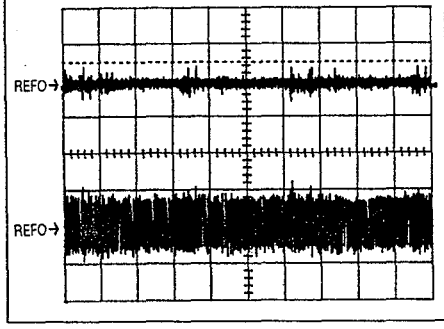

④ CH1: TEY 0.5V/div. 5ms/div.
⑤ CH2: TIN 1V/div.
Test mode: 100 track jump (FWD)



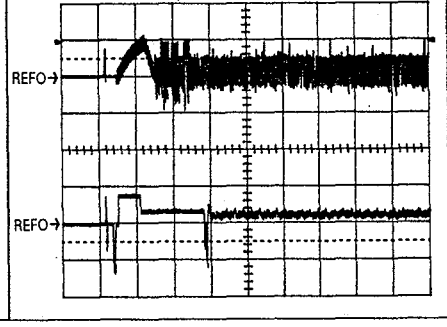

④ CH1: TEY 0.5V/div. 0.1s/div.
⑥ CH2: FEY 0.5V/div.
Normal mode: AGC after focus close



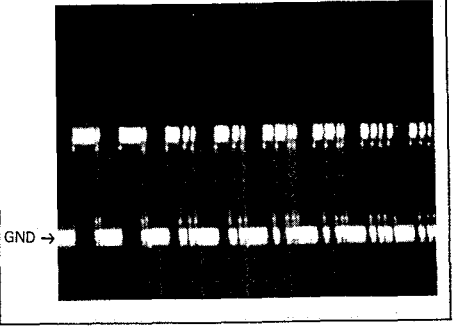

⑥ CH1: FEY 0.2V/div. 20ms/div.
② CH2: FIN 0.5V/div.
Normal mode: Play



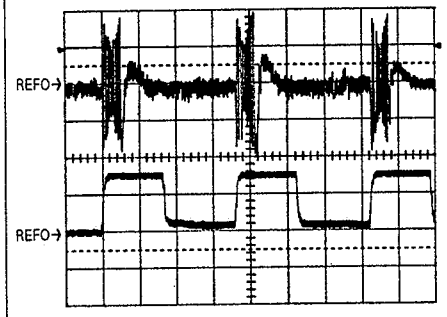

② CH1: FIN 1V/div. 0.5s/div.
⑦ CH2: SIN 1V/div.
Normal mode: Focus close (8cm)



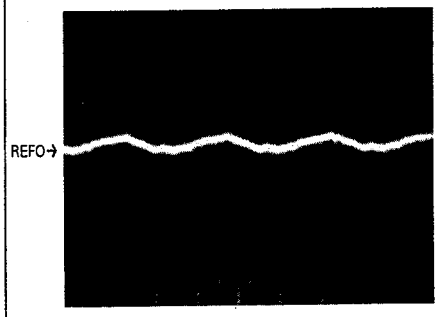

⑫ DATA 2V/div. 10µs/div.
Play



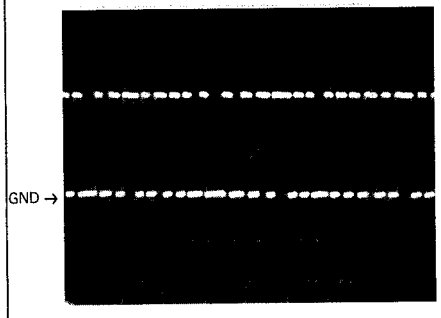
④ CH1: TEY 0.5V/div. 5ms/div.
⑧ CH2: CIN 0.5V/div.
Test mode: 100 track jump (FWO)



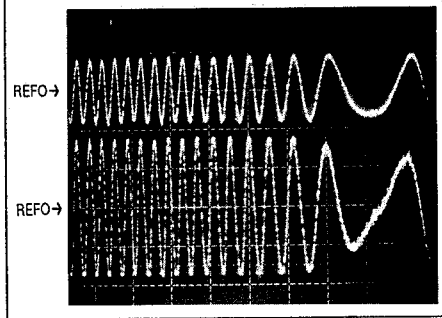

⑦ SIN 0.5V/div. 50ms/div.
Normal mode: 1Play (12cm disc)



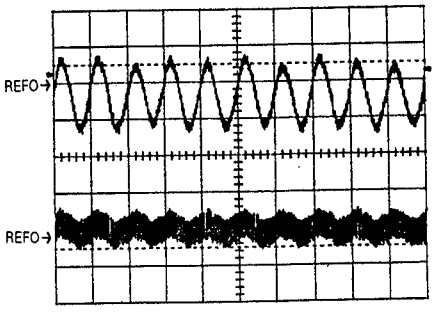

⑨ EFM 2V/div. 5µs/div.
Play



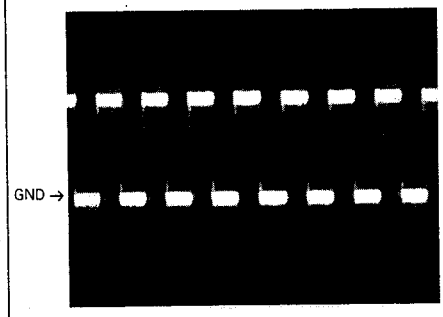

④ CH1: TEY 1V/div. 2ms/div.
⑩ CH2: TEC 1V/div.
Test mode: Focus closed
Tracking open



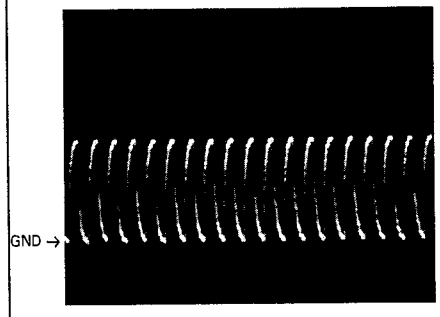

④ CH1: TEY 0.5V/div. 1ms/div.
⑤ CH2: TIN 0.5V/div.
Normal mode: During AGC




⑬ LRCK 2V/div. 20µs/div.
Play




⑪ SCKO 2V/div. 1µs/div.
Play



# 12. EXPLODED VIEW AND PARTS LIST

## 12.1 CHASSIS

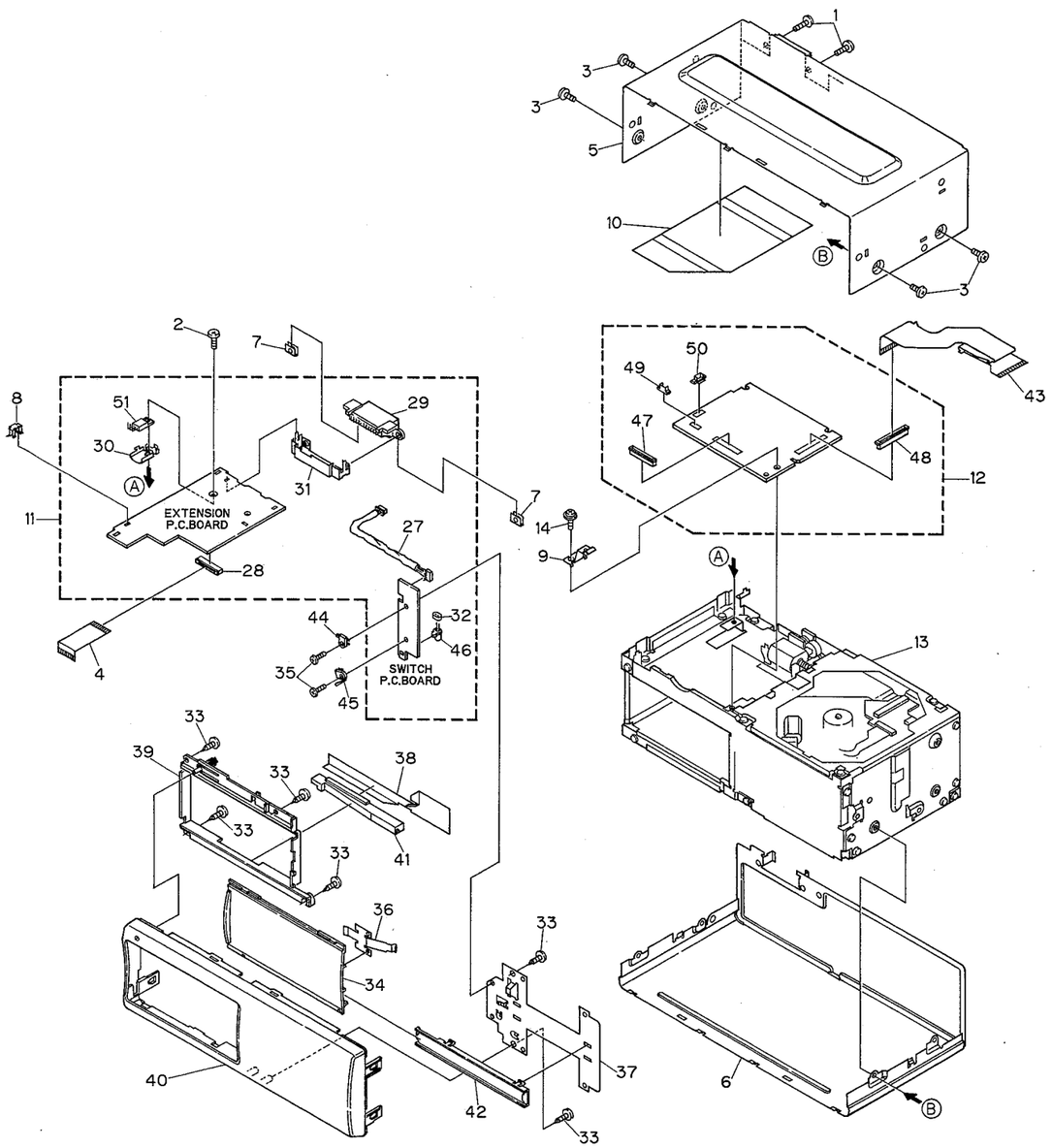



Fig. 11



**NOTES:**

●Parts marked by "＊"are generally unavailable because they are not in our Master Spare Parts List.

● **Parts List**

| Mark | No. | Description | Part No. |
|---|---|---|---|
| | 1 | Screw | BMZ26P060FZK |
| | 2 | Screw | BMZ26P080FMC |
| | 3 | Screw | BMZ30P040FZK |
| | 4 | Connector | CDE4490 |
| | 5 | Case | CNB1978 |
| | 6 | Case | CNB1979 |
| | 7 | Spacer | CNC5536 |
| | 8 | Earth Plate | CNC5769 |
| | 9 | Earth | CNC6340 |
| | 10 | Insulator | CNM4473 |
| | 11 | Extension Unit | CWX1906 |
| | 12 | Main Unit | CWX1868 |
| | 13 | CD Mechanism Unit | CXK4170 |
| | 14 | Screw | IMS26P040FMC |
| 15-26 | ····· | | |
| | 27 | Connector(CN1704) | CDE4718 |
| | 28 | Connector(CN1101) | CKS2224 |
| | 29 | Connector(CN1102) | CKS2398 |
| | 30 | Heat Sink | CNC4447 |
| | 31 | Shield | CNC6047 |

| Mark | No. | Description | Part No. |
|---|---|---|---|
| | 32 | Bush | CNV2858 |
| | 33 | Screw | BPZ26P080FMC |
| | 34 | Door | CAT1691 |
| | 35 | Screw | CBA1110 |
| | 36 | Spring | CBL1162 |
| | 37 | Holder | CNC6046 |
| | 38 | Cover | CNM3795 |
| | 39 | Sub Grille | CNS3651 |
| | 40 | Grille | CNS3650 |
| | 41 | Lens | CNV3413 |
| | 42 | Rail | CNV3487 |
| | 43 | P.C.Board | CNP3954 |
| | 44 | Switch(S1703) | CSN1012 |
| | 45 | Switch(S1704) | CSN1025 |
| | 46 | Lamp(IL1701) | CEL1350 |
| | 47 | Connector(CN1701) | CKS2770 |
| | 48 | Connector(CN1801) | CKS2779 |
| | 49 | Connector(CN1703) | CKS3126 |
| | 50 | Connector(CN1802) | CKS3127 |
| | 51 | Transistor(Q1501) | 2SB942 |

## 12.2 CD MECHANISM UNIT

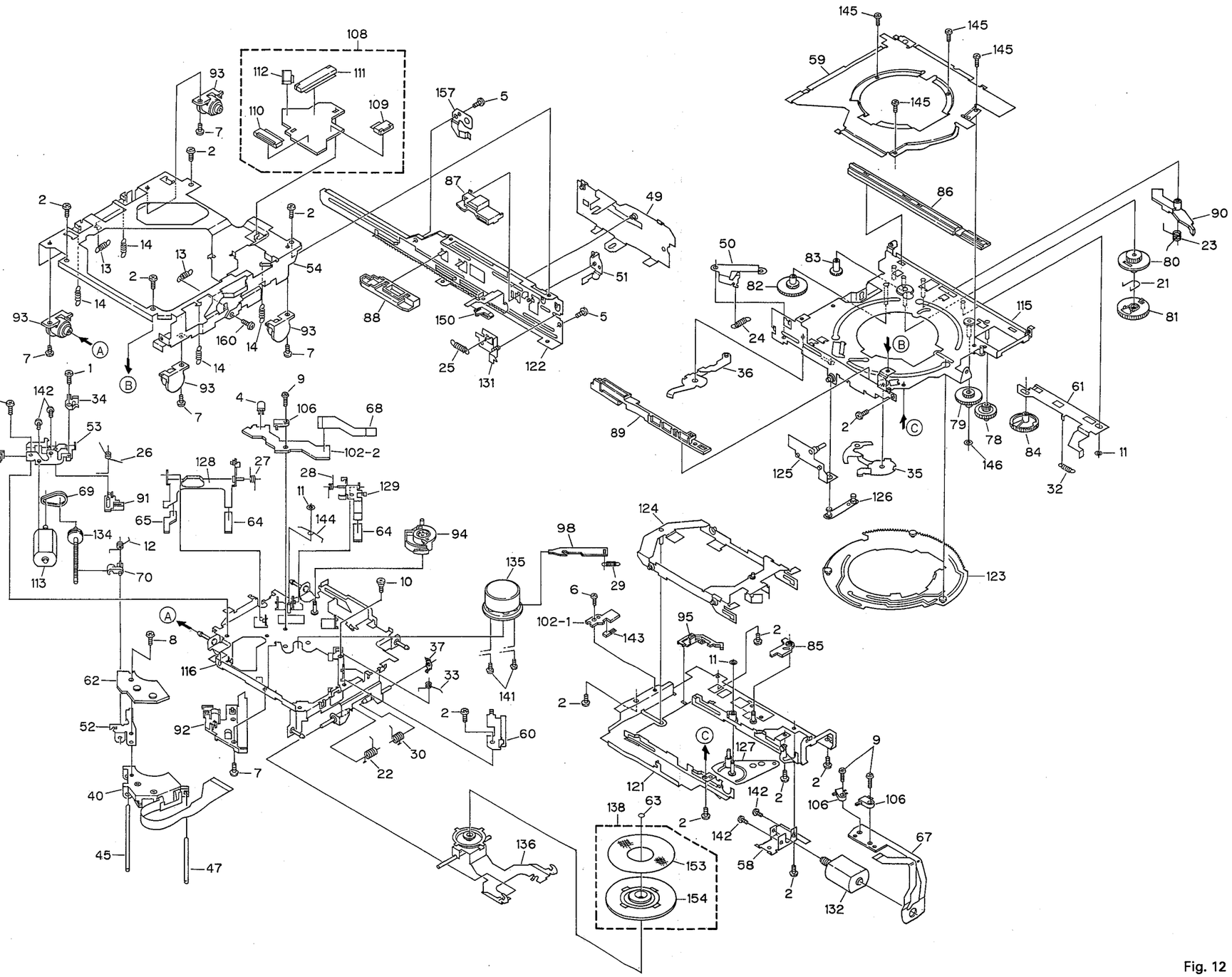



Fig. 12

## ● Parts List

| Mark No. | Description | Part No. |
|---|---|---|
| 1 | Screw | BMZ20P030FMC |
| 2 | Screw | BMZ20P025FMC |
| 3 | Screw | CBA1065 |
| 4 | LED | BR4361F |
| 5 | Screw | CBA1037 |
| 6 | Screw | CBA1041 |
| 7 | Screw | CBA1077 |
| 8 | Screw | CBA1086 |
| 9 | Screw | CBA1229 |
| 10 | Screw | CBA1243 |
| 11 | Washer | CBF1038 |
| 12 | Spring | CBH1488 |
| 13 | Spring | CBH1497 |
| 14 | Spring | CBH1498 |
| 15,16 | ····· | |
| 17 | Spring | CBH1589 |
| 18 | Spring | CBH1675 |
| 19 | Spring | CBH1592 |
| 20 | Spring | CBH1593 |
| 21 | Spring | CBH1594 |
| 22 | Spring | CBH1596 |
| 23 | Spring | CBH1876 |
| 24 | Spring | CBH1599 |
| 25 | Spring | CBH1604 |
| 26 | Spring | CBH1605 |
| 27 | Spring | CBH1606 |
| 28 | Spring | CBH1607 |
| 29 | Spring | CBH1843 |
| 30 | Spring | CBH1633 |
| 31 | Spring | CBH1667 |
| 32 | Spring | CBH1706 |
| 33 | Spring | CBH1841 |
| 34 | Spring | CBL1157 |
| 35 | Arm | CBL1186 |
| 36 | Arm | CBL1187 |
| 37 | Spring | CBL1210 |
| 38 | Spring | CBH1787 |
| 39 | Spring | CBH1674 |
| 40 | PU Unit | CGY1036 |
| 41 | Spring | CBH1720 |
| 42 | Connector | CDE4743 |
| 43 | Link | CNC5584 |
| 44 | Rear Frame | CNC5586 |
| 45 | Shaft | CLA2027 |
| 46 | Shaft | CLA2322 |

| Mark No. | Description | Part No. |
|---|---|---|
| 47 | Shaft | CLA2345 |
| 48 | Lever | CNC5590 |
| 49 | Lever | CNC5166 |
| 50 | Arm | CNC5168 |
| 51 | Arm | CNC5169 |
| 52 | Bracket | CNC5170 |
| 53 | CM Bracket | CNC5171 |
| 54 | Cover | CNC5587 |
| 55 | Main Frame | CNC6087 |
| 56 | Upper Frame Unit | CXA8857 |
| 57 | Side Frame(R) | CNC6257 |
| 58 | Bracket | CNC5462 |
| 59 | Cover | CNC5567 |
| 60 | Cover | CNC5576 |
| 61 | Lever | CNC5678 |
| 62 | Plate | CNC5782 |
| 63 | Spacer | CNM1787 |
| 64 | Sheet | CNM3897 |
| 65 | Sheet | CNM4337 |
| 66 | Insulator | CNM4266 |
| 67 | P.C.Board | CNP6258 |
| 68 | P.C.Board | CNP3730 |
| 69 | Belt | CNT1047 |
| 70 | Rack | CNV3355 |
| 71 | Holder | CNV3363 |
| 72 | Side Frame(L) | CNC6258 |
| 73 | Bracket | CNC5988 |
| 74 | Guide | CNV3756 |
| 75 | Arm | CNV3757 |
| 76 | Arm | CNV3758 |
| 77 | Gear | CNV4331 |
| 78 | Worm Wheel | CNV3761 |
| 79 | Gear | CNR1382 |
| 80 | Gear | CNV3763 |
| 81 | Gear | CNV3764 |
| 82 | Gear | CNV3765 |
| 83 | Gear | CNV3766 |
| 84 | Gear | CNV3767 |
| 85 | Arm | CNV3769 |
| 86 | Guide | CNV3770 |
| 87 | Guide | CNV3771 |
| 88 | Guide | CNV4470 |
| 89 | Guide | CNV4557 |
| 90 | Arm | CNV3775 |
| 91 | Bearing | CNV3778 |

| Mark No. | Description | Part No. |
|---|---|---|
| 92 | Holder | CNV3779 |
| 93 | Damper | CNV3780 |
| 94 | Cam | CNV4593 |
| 95 | Guide | CNV3784 |
| 96 | Guide | CNV3785 |
| 97 | Arm | CNV3787 |
| 98 | Plate | CNV3912 |
| 99 | Gear | CNV4005 |
| 100 | Gear | CNV4006 |
| 101 | Gear | CNV4340 |
| 102 | Composite P.C.Board | CNX2237 |
| 103 | Rack | CNV4009 |
| 104 | Arm | CNV4010 |
| 105 | Guide | CNV4104 |
| 106 | Switch | CSN1012 |
| 107 | Switch | CSN1025 |
| 108 | P.C.Board Unit | CWX1809 |
| 109 | Connector(6P) | CKS1944 |
| 110 | Connector(17P) | CKS1955 |
| 111 | Connector(30P) | CKS1968 |
| 112 | Connector(7P) | CKS2406 |
| 113 | Motor Unit(M804) | CXA4649 |
| 114 | ····· | |
| 115 | Stage Chassis Unit | CXA6608 |
| 116 | CRG Chassis Unit | CXA6609 |
| 117 | Gear | CNV4004 |
| 118 | Steer Unit | CXA7267 |
| 119 | Bracket Unit | CXA8108 |
| 120 | Magazine Holder Unit | CXA8856 |
| 121 | Lower Cover Unit | CXA6614 |
| 122 | Bracket Unit | CXA8178 |
| 123 | Cam Ring Unit | CXA6616 |
| 124 | Lever Unit | CXA6619 |
| 125 | Lever Unit | CXA6620 |
| 126 | Link Unit | CXA6621 |

| Mark No. | Description | Part No. |
|---|---|---|
| 127 | Arm Unit | CXA6622 |
| 128 | Arm Unit | CXA6623 |
| 129 | Arm Unit | CXA6624 |
| 130 | Frame Unit | CXA7271 |
| 131 | Lever Unit | CXA8421 |
| 132 | Motor Unit(M803) | CXA6977 |
| 133 | Motor Unit(M802) | CXA7272 |
| 134 | Screw Unit | CXA6990 |
| 135 | Motor Unit(M801) | CXA8217 |
| 136 | Arm Unit | CXA8957 |
| 137 | Arm Unit | CXA7273 |
| 138 | Clamer Unit | CXA7632 |
| 139 | Damper Unit | CXA7450 |
| 140 | Spring | CBL1216 |
| 141 | Screw | JFZ17P025FNI |
| 142 | Screw | JFZ20P025FNI |
| 143 | Photo-Transistor (P801,802) | PT4800 |
| 144 | Spring | CBH1741 |
| 145 | Screw | JFZ20P014FMC |
| 146 | Washer | CBF1002 |
| 147 | Spring | CBL1203 |
| 148 | Screw | CBA1340 |
| 149 | Arm | CNV4185 |
| 150 | Guide | CNV4558 |
| 151 | Composite P.C.Board | CNX2531 |
| 152 | Composite P.C.Board | CNX2407 |
| 153 | Sheet | CNM4071 |
| 154 | Clamper | CNV3774 |
| 155 | Plug | CKS3406 |
| 156 | Screw | CBA1114 |
| 157 | Spring | CBL1238 |
| 158 | Spacer | CNC6435 |
| 159 | Spring | CBL1285 |
| 160 | Screw | CBA1371 |
| 161 | Holder | CNV4486 |

## ● CD Mechanism Unit

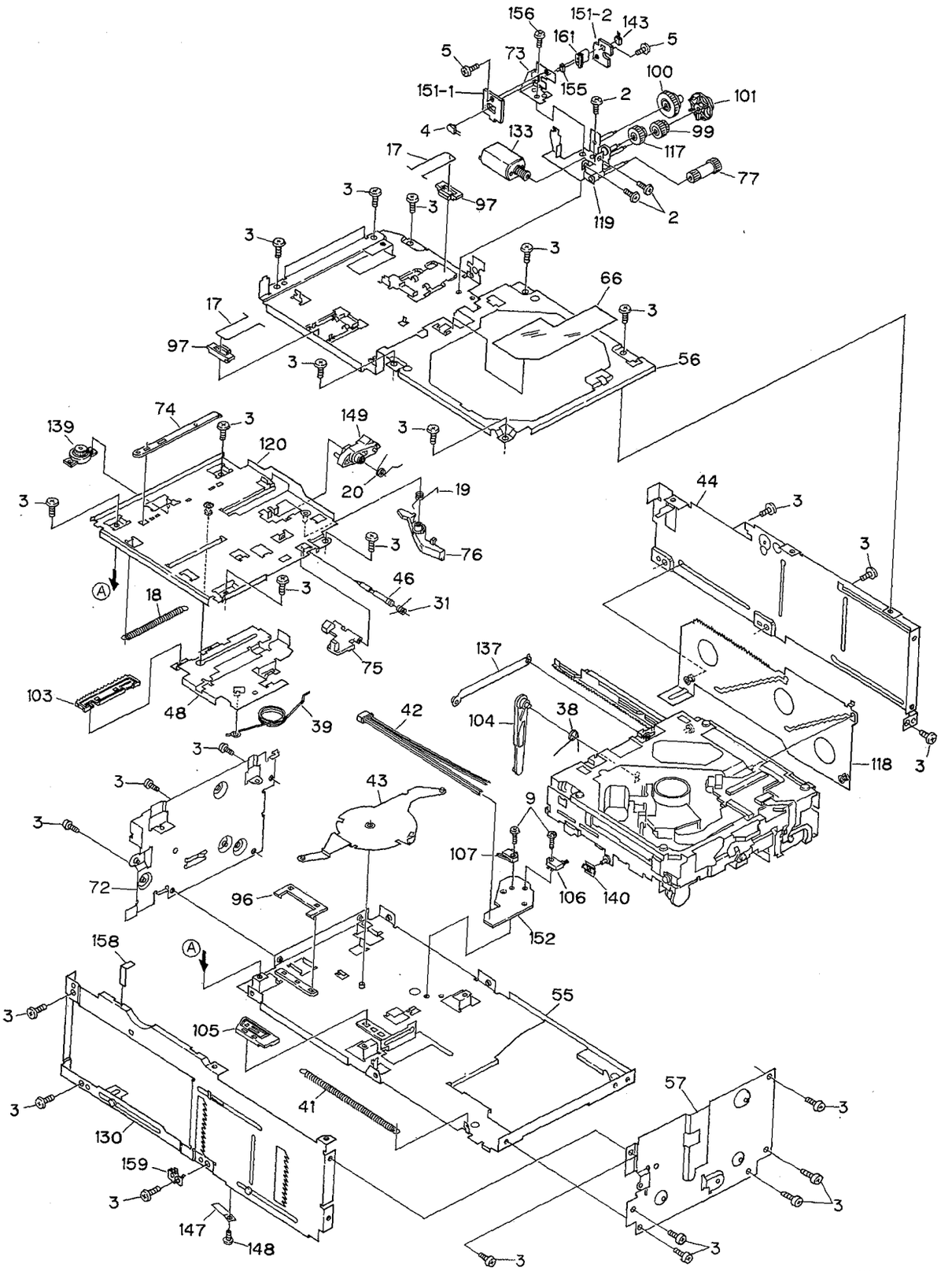



Fig. 13

## 12.3 MAGAZINE ASSY(CXA7122)

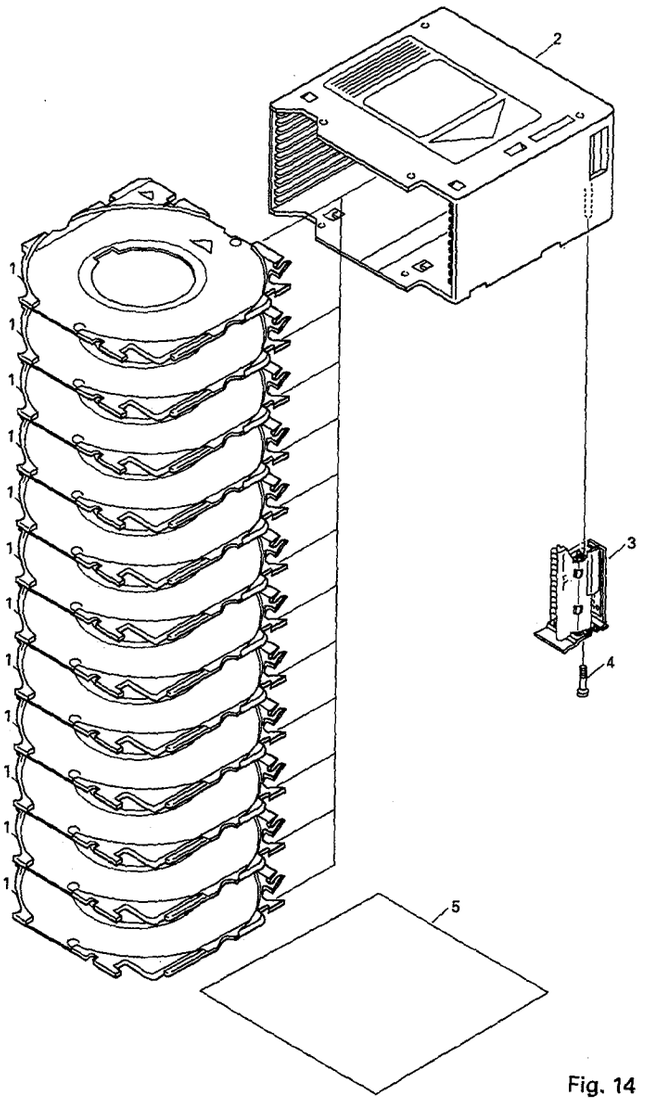



Fig. 14

● **Parts List**

| Mark No. | Description | Part No. |
|---|---|---|
| 1 | Tray Unit | CXA5484 |
| 2 | Case Unit | CXA6160 |
| 3 | Bracket Assy | CXA5475 |
| 4 | Screw Assy(M2X13) | CBA1272 |
| 5 | Label | CRW1269 |

# 13. PACKING METHOD

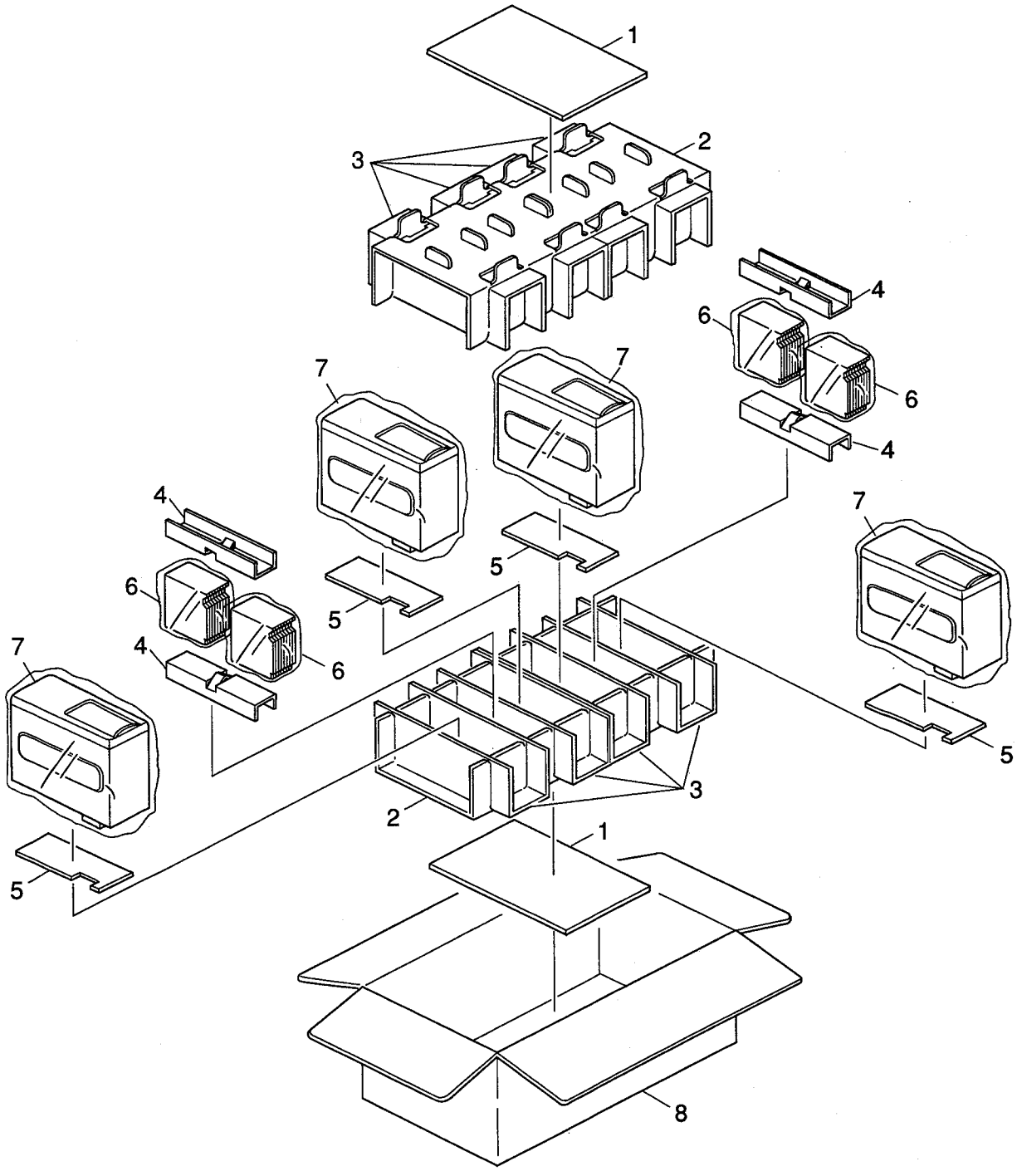



Fig. 14

● **Parts List**

| Mark No. | Description | Part No. |
|---|---|---|
| 1 | Board | CHW1327 |
| 2 | Protector | CHP1848 |
| 3 | Protector | CHP1849 |
| 4 | Protector | CHP1850 |
| 5 | Protector | CHP1851 |
| 6 | Magazine Assy | CXA7122 |
| 7 | Polyethylene Bag | CEG1149 |
| 8 | Contain Box | CHL3076 |

# 14. USING THE CEN-822 CD CONTROLLER TOOL

## 14.1 OUTLINE (FRONT PANEL)

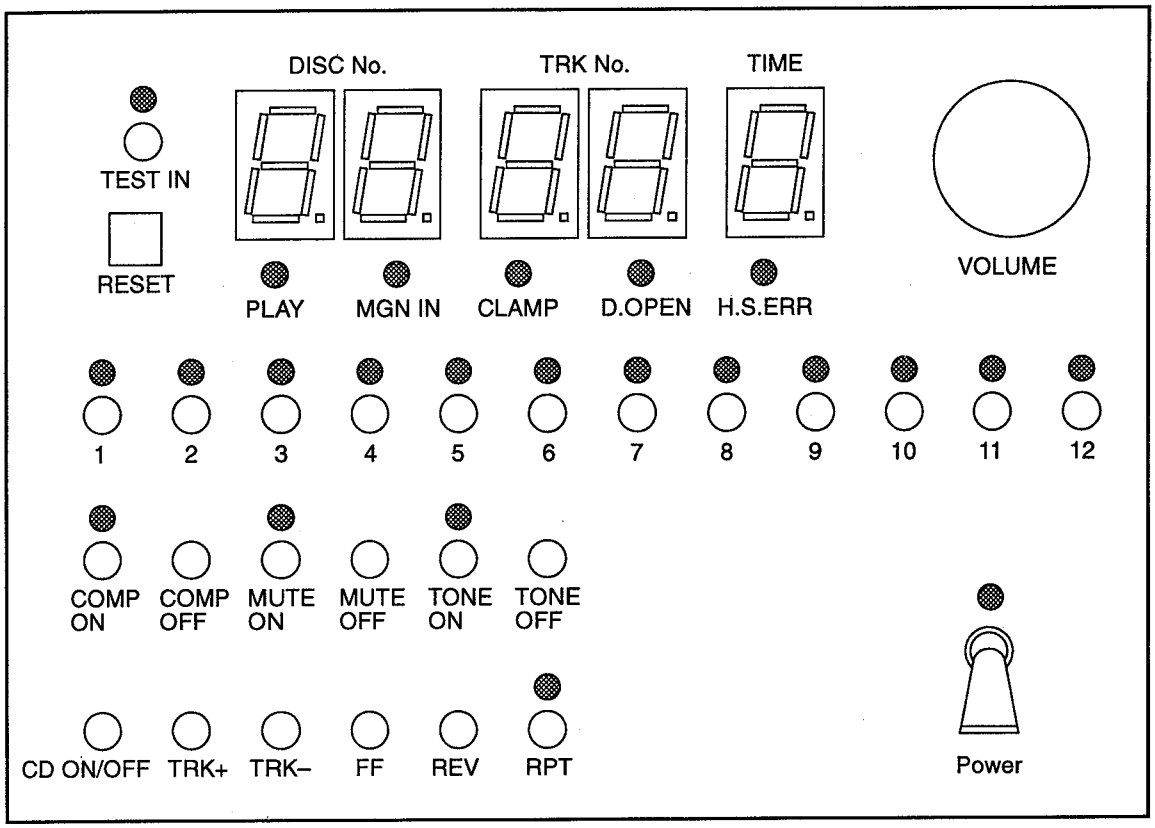



Fig. 15

Display

TEST IN: Lit during Test mode.
PLAY: Lit during play in Normal mode.
MGN IN: Lit when the magazine is inserted.
CLAMP: Lit when the machine is clamped.
D. OPEN: Lit when the door is open.
H.S. ERR: Lights up when an data communication error occurs between the controller and M-CD.
1-12: The LEDs for the trays with a disc inserted light up after Disc Sense in Normal mode.
COMP ON: Lit when Compression is ON.
MUTE ON: Lit when Mute is ON.
TONE ON: Lit when Test Tone is ON (for factory use).
RPT: Lit during Repeat Playback in Normal mode.
TIME: Only the seconds are displayed on the TIME display.

## 14.2 OUTLINE (REAR PANEL)

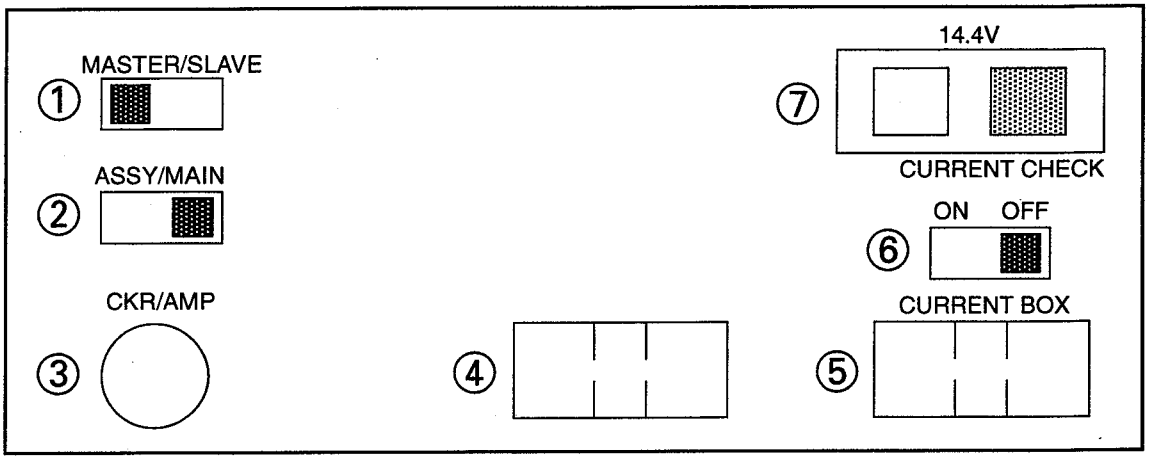



Fig. 16

① Set to the MASTER side. (The SLAVE side is not used.)
② Set to the MAIN side. (The Assy side is not used.)
③ Connect a power amplifier with 8pin DIN input.
④ Connect the changer using the CDN-960.
⑤ Not used
⑥ Set to the OFF side.
⑦ Connect to the power supply.

## 14.3 CONNECTION DIAGRAM

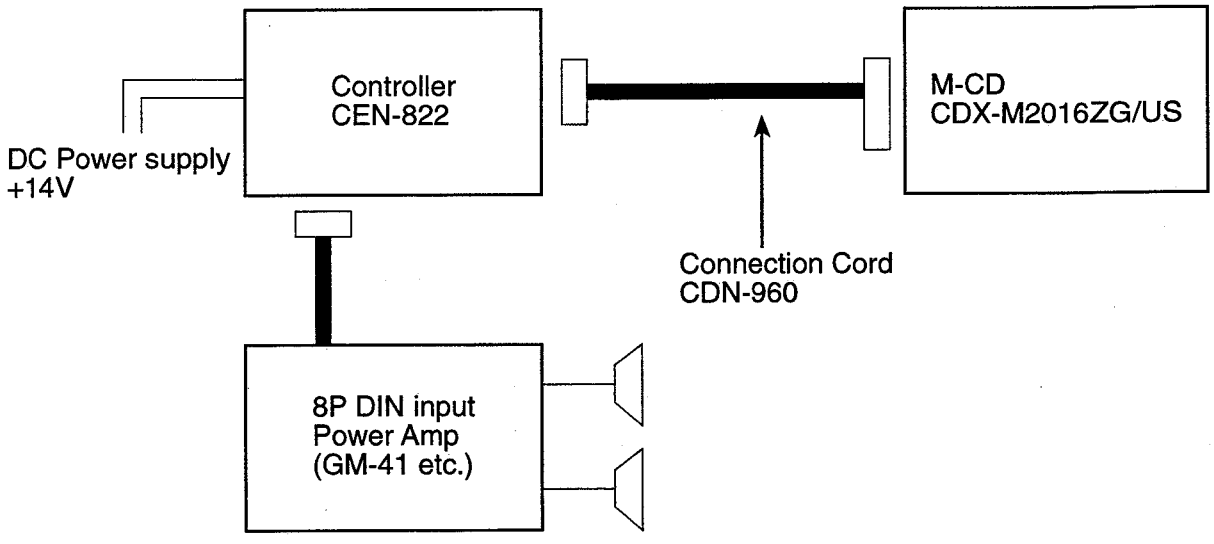



Fig. 17

Note: To operate the system, a power amplifier must be connected.

## 14.4 HOW TO USE

a) Normal mode

1. Connect the M-CD (CDX-M2016ZG/US) to the Controller Tool. (See the connection diagram.)
2. Switch the power of the Controller Tool ON (see Figure *1).
3. Insert the magazine. (The system performs Disc Sense. The LEDs (1 to 12) for the trays with a disc inserted light up. Other operations cannot be performed during Disc Sense.)
4. Press the [CD ON/OFF] button to play the current disc (see Figure *2).
5. See Table 1 for other operations. (To change discs, use the 1 to 12 buttons during playback to select a disc.)

b) Test mode

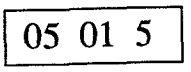
1. While holding down the [TEST IN] button, press the [RESET] button.
   Release the (RESET) button and then the (TEST IN) button (see Figure *3).
2. Press the [CD ON/OFF] button to set the regulator to ON (see Figure *4).
3. Press the [RPT] button to close the FOCS servo.
4. Press the [TRK+] button to close the TRKG servo (see Figure *5).
   Pressing the [TRK+] button twice displays the focus gain on the TRK NO display. Pressing the [TRK+] button three times displays the tracking gain on the TRK NO display. (Default for gain in AGC is 20.)
5. See Table 1 for other operations.

Note: If the system is affected by memory or a malfunction (for example, cannot activate or cancel Test mode), switch the power of the system OFF then ON again, then reset the M-CD.

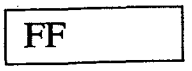
**LCD Display**

*1

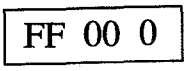
*2




*3




*4




*5

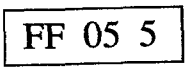



**Table 1**

Perform adjustment according to the adjustment items.

| Buttons | Movement | |
|---|---|---|
| | Nomal Mode | Test Mode |
| TEST IN | – | Enter into the test mode |
| RESET | Reset | Reset |
| 1–12 | Disc select | Disc select |
| COMP ON | Digital compression ON | – |
| COMP OFF | Digital compression OFF | – |
| MUTE ON | Mute ON | – |
| MUTE OFF | Mute OFF | – |
| TONE ON | Test tone ON (for factory use) | – |
| TONE OFF | Test toneOFF (for factory use) | – |
| CD ON/OFF | Play/Stop | Regulator ON/OFF |
| TRK + | Forward TRK search | TRK close/ACC display change |
| TRK – | Reverse TRK search | TRK open |
| FF | Forward scan | Forward PU transfer |
| REV | Reverse scan | Reverse PU transfer |
| RPT | Repeat | Focus close |

PIONEER®
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PION-04367

# Service Manual

ORDER NO.
**CRT1658**

CD MECHANISM UNIT

# CX-633

COMPACT disc DIGITAL AUDIO

- **This service manual describes operation of the CD mechanism incroporated in models listed in the table below.**
- **When performing repairs use this manual together with the specific manual for model under repair.**

| Model | Service Manual | CD Mechanism Unit |
|---|---|---|
| CDX-P1210/UC,EW,ES | CRT1659 | CXK4100 |

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1. DISASSEMBLY ..... 2
2. MECHANISM DESCRIPTION ..... 5



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# 1. DISASSEMBLY

## ● PU Unit Removal

When removing the connector to the PU unit, attach a short pin from the PU unit to the flexible circuit board.

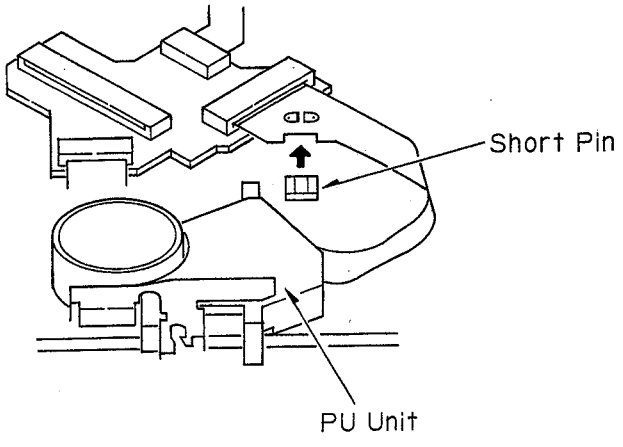



Fig.1

1. Remove the flexible circuit board from the connector.
2. Stretch the spring and hook it on the protrusion.
3. Undo the screw and remove the spring A.

NOTE: When assembling the PU unit, assemble so that section A clamps the shaft.

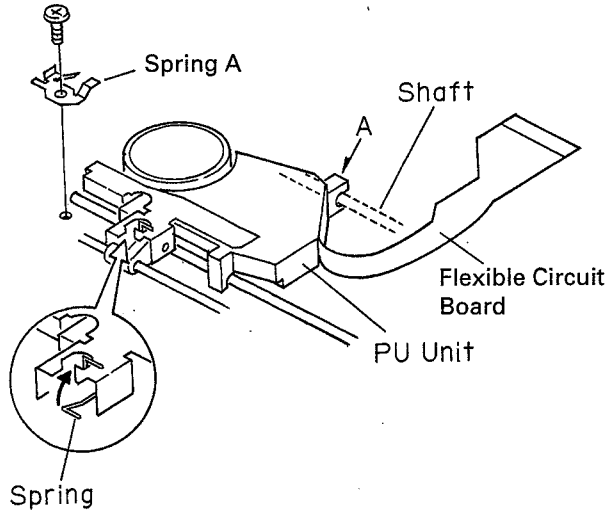



Fig.2

## ● Carriage Motor Assy Removal

1. Remove the screw, spring, belt, screw unit, and then remove the carriage motor assy.

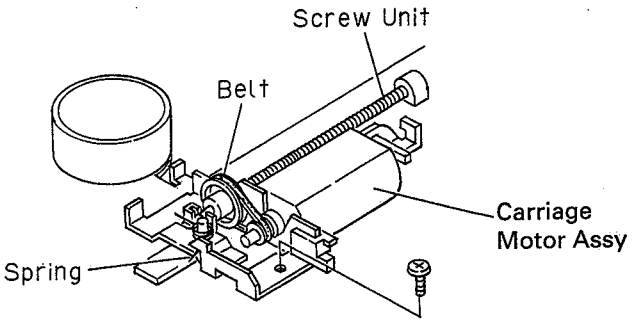



Fig.3

## ● Spindle Motor Removal

1. Undo the seven screws A, and then remove the frame and arm.
2. Undo the six screws B, and then remove the side frame.
3. Run the tray motor to and set the carriage mechanism to play (carriage mechanism lock is released).

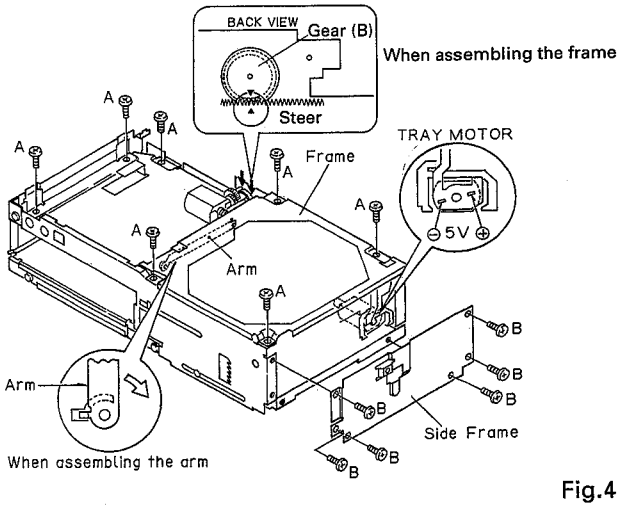



Fig.4

NOTE:

When assembling the frame, place the gear shaft with the arrow mark in the chassis, and align the ▲ mark of the steering to the ▲ of the gear B.

To assemble the arm, stand it upright and place it in the installation hole of the stage. Push it down towards the right and place the other end in the hole of the frame.

4. Turn the mechanism to its rear.
5. Remove the two springs; remove the clamper arm and spacer.

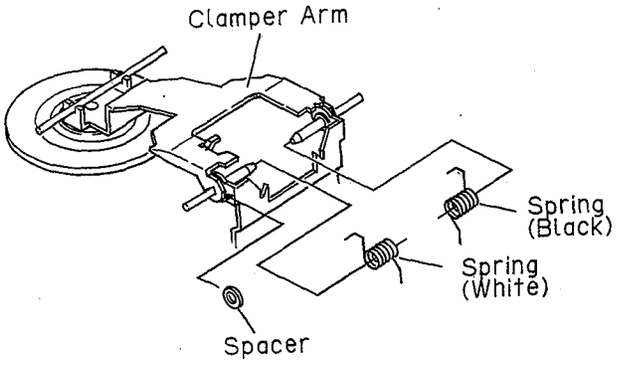



Fig.5

6. Face the mechanism forward.
7. Undo the six screws and remove the carriage mechanism assy.

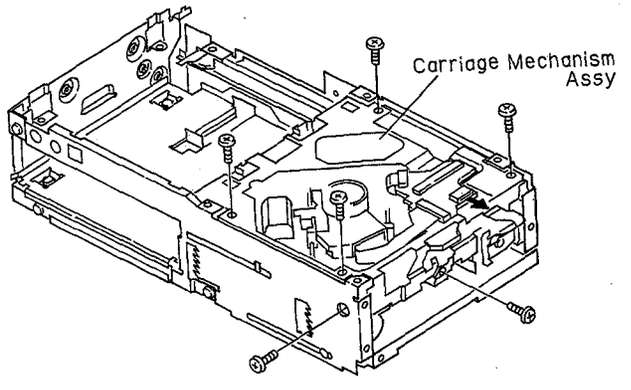



Fig.6

8. Remove the spring and side pressure arm.
   If the side pressure arm is difficult to remove, turn the cam in the direction of the arrow, flip the disc clamper up, and then remove the side pressure arm.
9. Undo the two screws and remove the spindle motor.

NOTE: When assembling the motor, tighten the screws at the position (angle) where the motor's lead wires reach the circuit board.

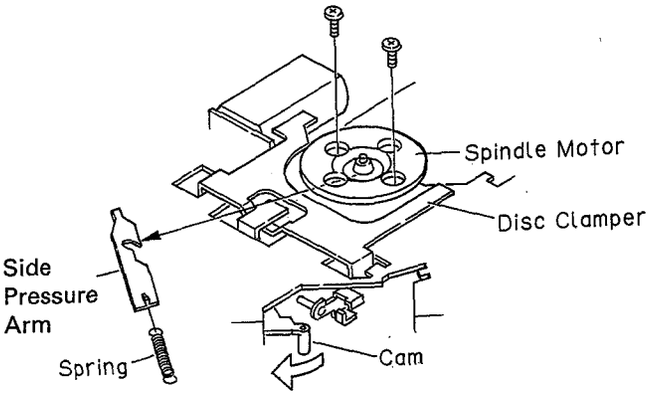



Fig.7

## ● Tray Motor Removal

1. Turn the mechanism to its rear.
2. Undo the one screw and remove the tray motor unit.

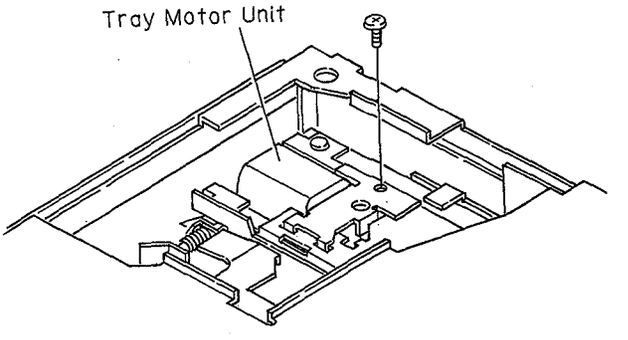



Fig.8

## ● Magazine Holder Removal

1. Turn the tray motor to set the mechanism at the area halfway between play and stop.
2. Undo the four screws and remove the magazine holder.

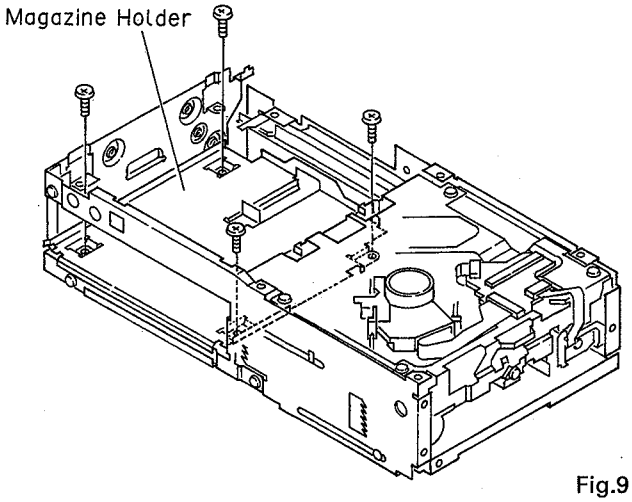



Fig.9

## ● Meshing of Gears When Assembling (fig. shows top view of mechanism)

Cam ring is turned all the way in the counter-clockwise direction.

1. Tray extraction gear section

A) Intermittent gear

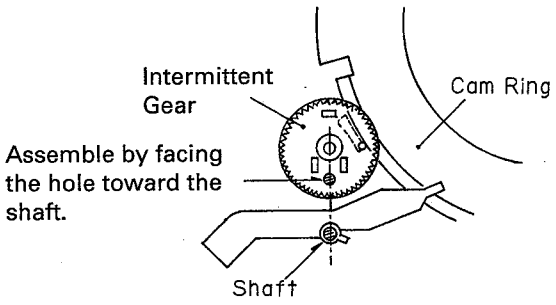



Fig.10

B) Acceleration gear

Assemble by overlapping the holes of the intermittent gear and acceleration gear.

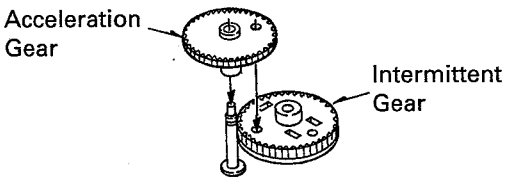



Fig.11

C) Idler gear

Assemble so that the tooth of the acceleration gear with the △ mark meshes with the valley of the idler gear with the △ mark.

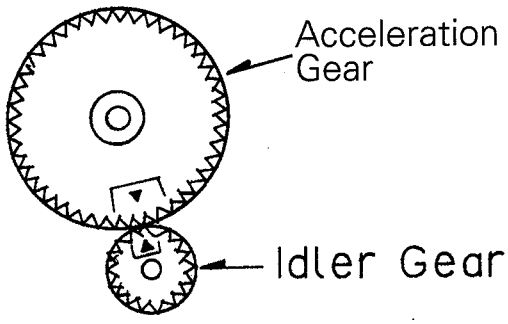



Fig.12

D) Tray gear

Assemble so that the tooth of the idler gear with the ○ mark meshes with the valley of the tray gear with the ○ mark. Also, assemble so that the valley of the tray gear with the △ mark meshes with the last tooth at the end of the tray extraction lever's rack.

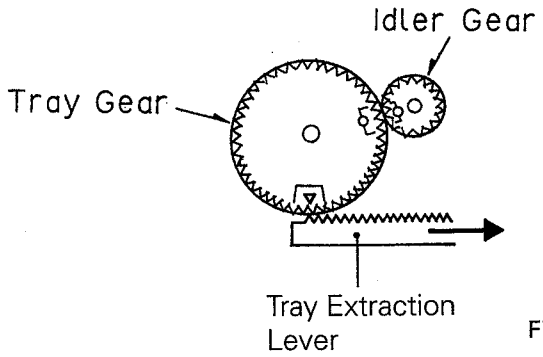



Fig.13

# 2. MECHANISM DESCRIPTION

## ● Magazine Insertion

1. When the magazine is inserted against the force of the eject lever's spring, the eject lever pushes the tip of the magazine SW arm directly before the magazine lock position, causing the arm to swing. This in turn causes the part where the magazine lock arm and magazine SW arm overlap to separate, with the magazine lock arm swinging upward.

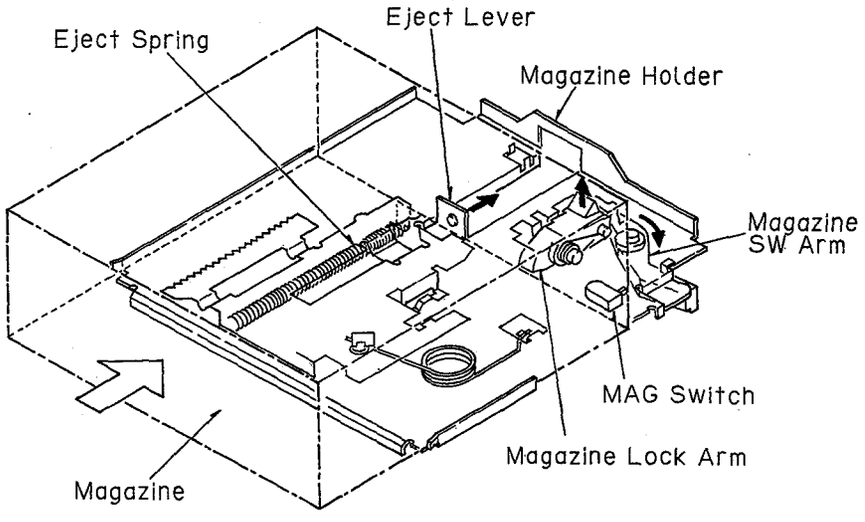



Fig.14

2. If the magazine is inserted up to the lock position, the catch of the lock arm enters the magazine's lock slot, thus locking the magazine. The tapered part of the tip of the magazine lock arm pushes the magazine SW arm, thus tripping the MAG switch.

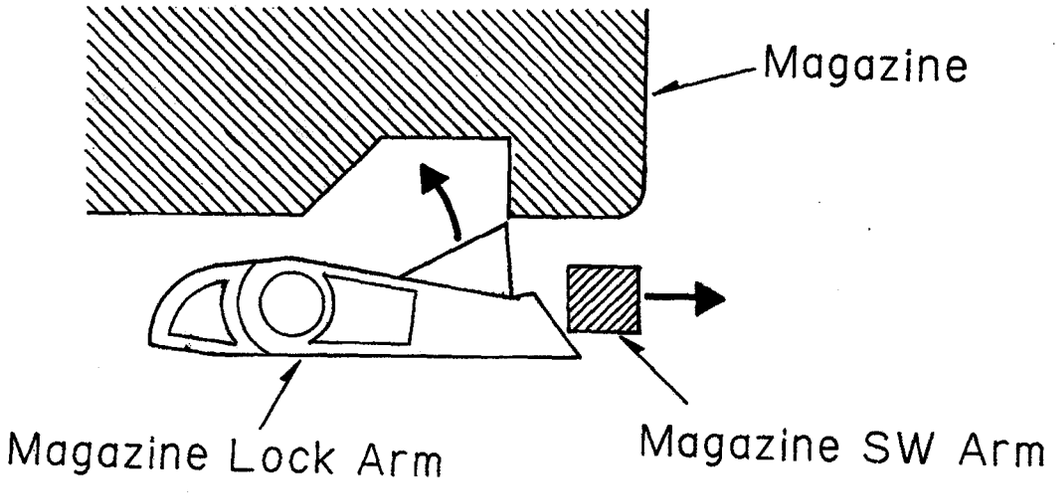



Fig.15

## ● Disc Clamp Operation

1. When the MAG switch is tripped, the tray motor turns and rotates the cam ring. When the cam ring rotates, the tray extraction intermittent gear and tray gear are rotated via the cam ring, causing the tray extraction lever to slide. The tray is then drawn out by the tray extraction lever.

View from below with the stage lower cover removed

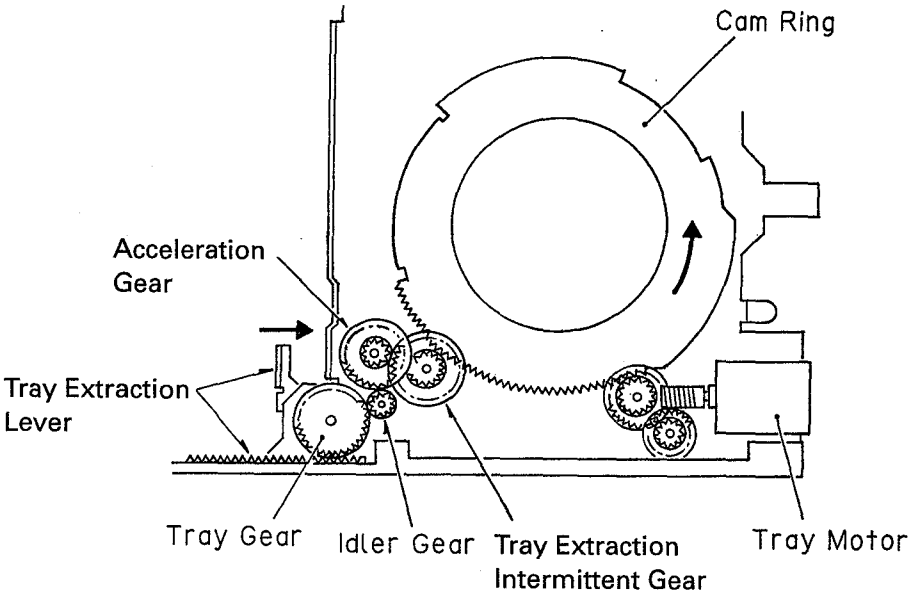



Fig.16

2. After the tray is drawn out, if using an 8 cm disc, the fingers of the disc clamper are released.

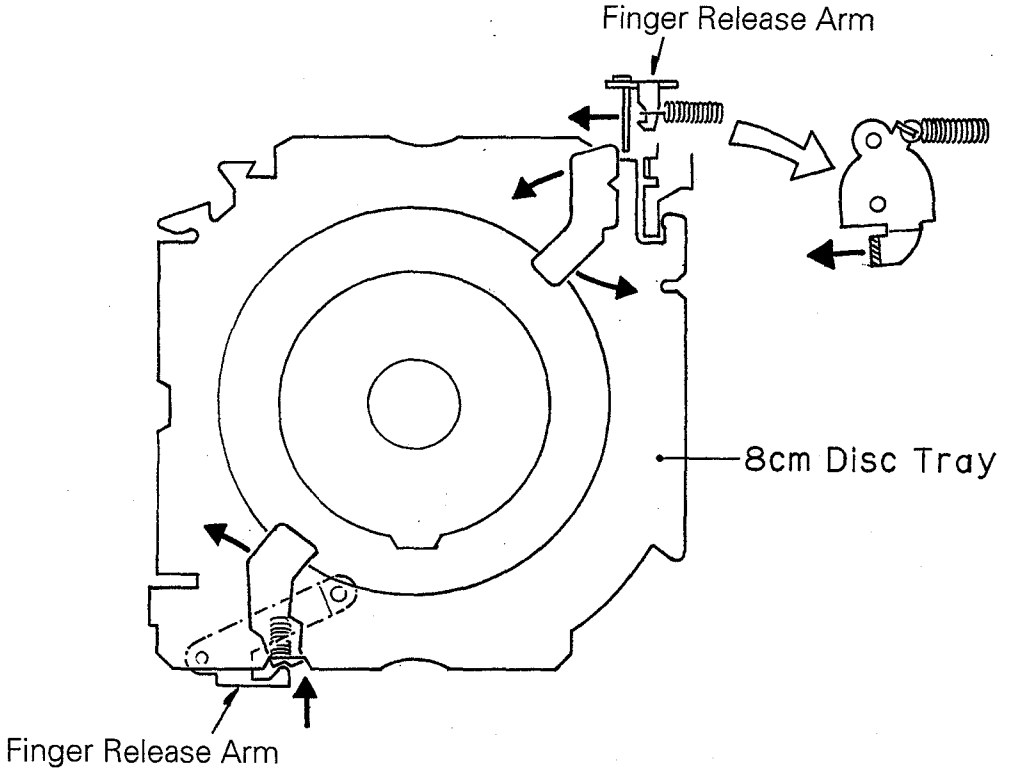



Fig.17

3. When the disc holder fingers have been released, the clamper arm rises and clamps the disc.

3-1. As the lever retaining the shaft at the tip of the clamper arm slides and escapes, the curved part of the cam ring simultaneously retains the shaft, and the spring-activated clamper arm rises.

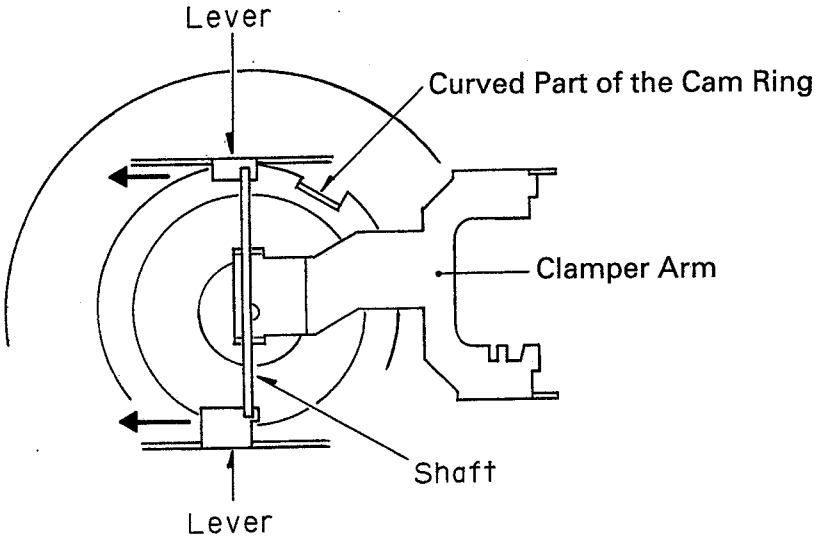



Fig.18

3-2. At the same time the disc clamp performs this action, the clamp and the large and small disc holder arms clamp the disc.

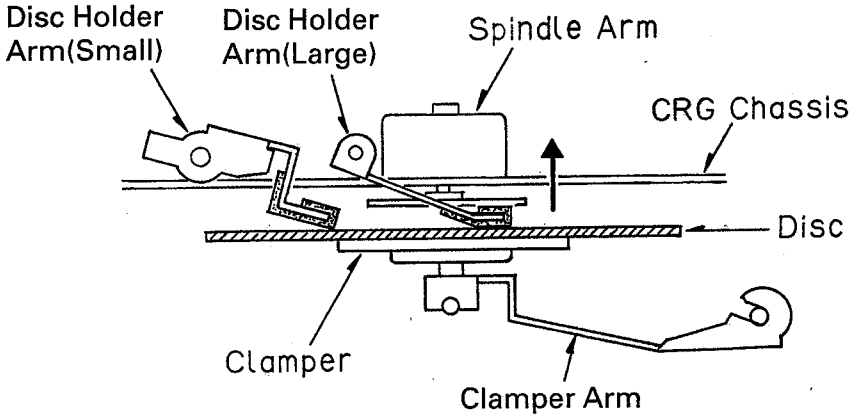



Fig.19

3-3. The large and small disc holder arms are moved up and down by the turning of the disc holder cam. The cam turns while being clamped by the curved part of the CRG lock lever.

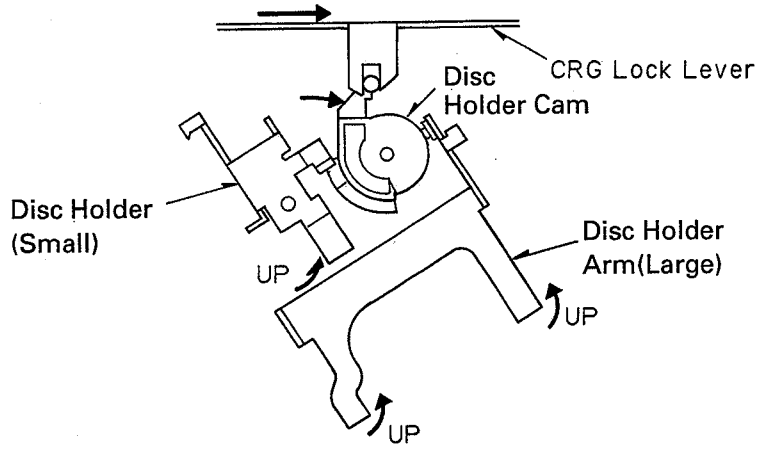



Fig.20

## ● CRG Chassis Lock Release

1. After clamping is complete, the tray motor continues to turn, and begins the procedure to release the CRG chassis locks. The locations of the locks are indicated by ① ② ③ in fig. 21. Locks ① ② ③ are released almost simultaneously.

① The cam ring turns causing the arm to rotate. The contraction of the arm tip and the CRG lock lever's slot are interlinked. When the arm turns, the CRG lock lever slides, thus releasing the CRG chassis's lock (up/down direction).(Fig. 22)

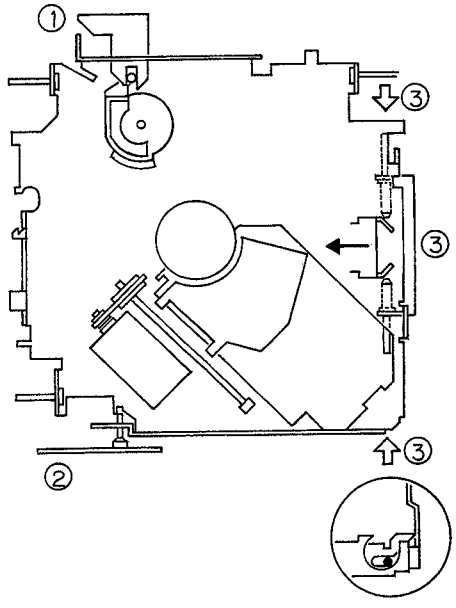



Fig.21

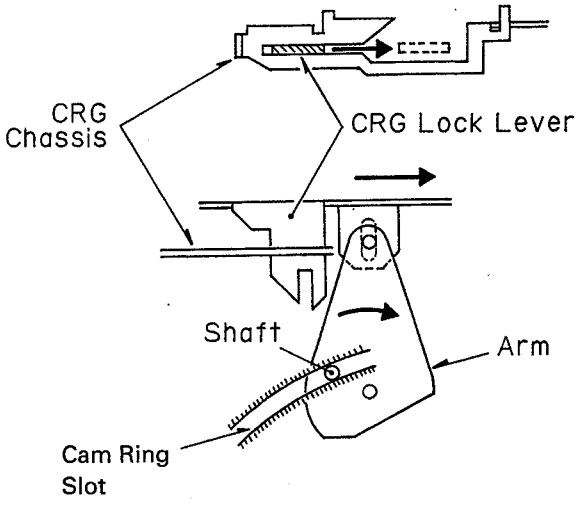



Fig.22

② The cam ring turns causing the link to be pushed, sliding the CRG lock lever, thus releasing the CRG chassis's lock (up/down direction).(Fig. 23)

③ The cam ring turns and the CRG lock lever slides. The tip of the lever inserted between the CRG chassis's shafts such that it is clamped by the shafts separates, thus releasing the CRG chassis's lock (front/rear direction).(Fig. 24)

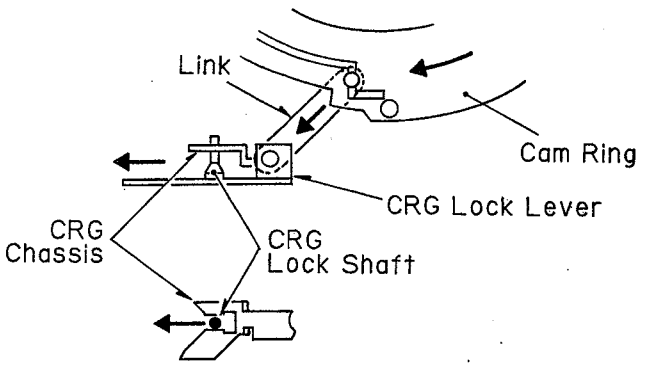



Fig.23

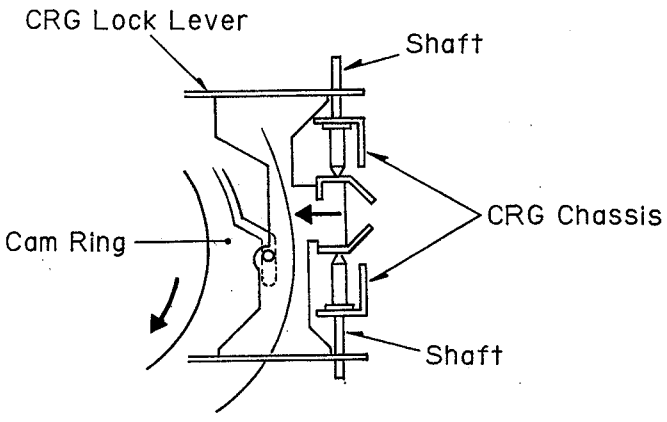



Fig.24

2. Simultaneously with the operation described above, the CRG lock lever slides, the CRG lock arm swings, freeing the clamped shaft and releasing the CRG chassis's up/down and right/left locks.
   The operations described above release the locks of the CRG mechanism leaving it "floating."

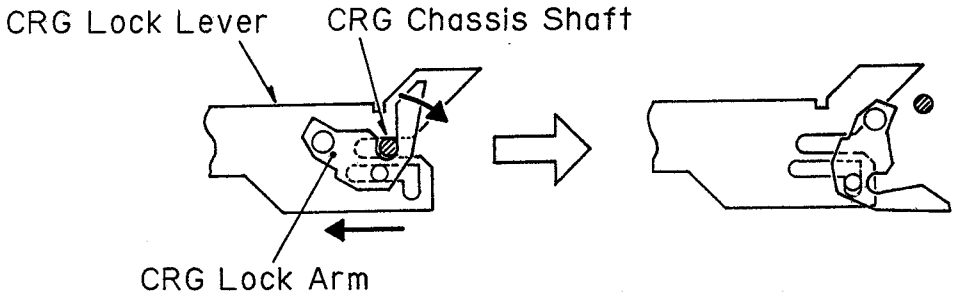



Fig.25

## ● Stage Lock

Looseness in the elevator mechanism is eliminated and vibration resistance is enhanced by locking the three (① ② ③) locations shown in fig. 26.

1. The CRG lock lever slides and pushes the stage lock lever. (Fig. 27)
2. The wedge shape of the lever tip is held in place by the square hole of the frame, and the stage mechanism is actuated in the left/right and up/down directions.(Fig. 27)

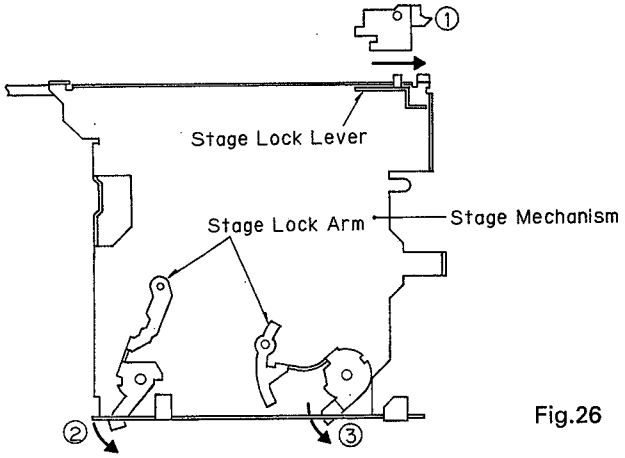



Fig.26

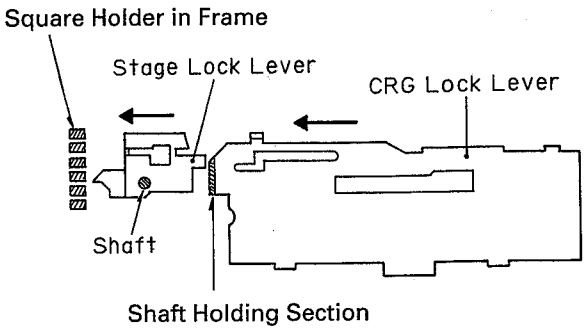



Fig.27

3. The rotation of the cam ring causes the stage lock arm to swing. The tip of the arm is held in place by the tapered part of the frame, and the stage mechanism is actuated in the left/right, up/down and front/rear directions.(Fig. 28,29)

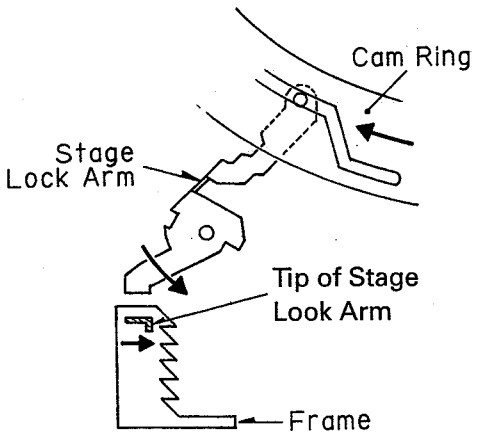



Fig.28

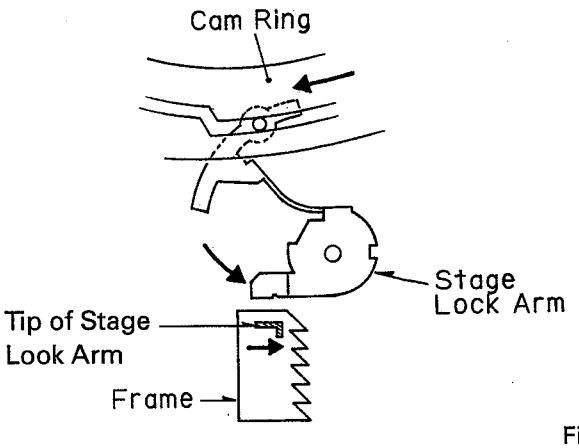


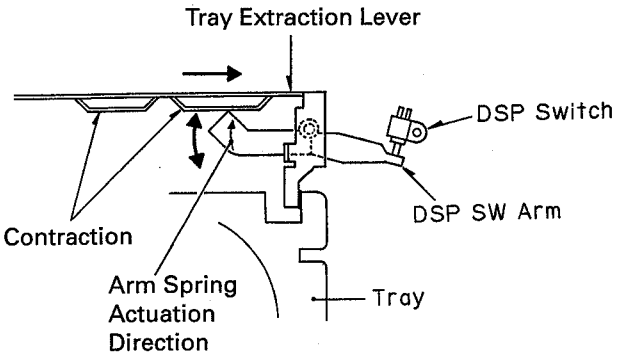

Fig.29

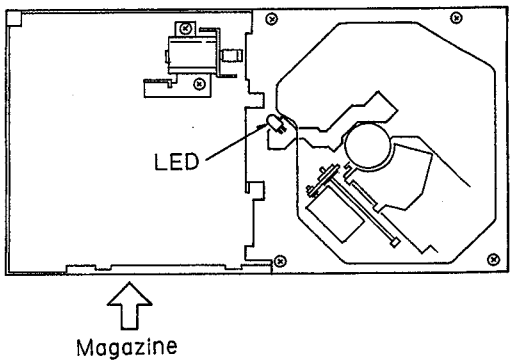
● **From Play to Tray Storage**

This operation is basically carried out in reverse of the operation from disc clamp to stage lock.

● **Disc Detection, Tray extraction/insertion Completion Detection**

The DSP switch is turned on and off by the contracting part of the tray extraction lever for extracting and inserting the tray, and the photosensor detects whether the tray contains a disc or not, and whether the disc is 8 or 12 cm, while being timed.




The photo-transistor is on the stage mechanism side and the LED is on the CRG mechanism side. The tray passes between the two.

Fig.30

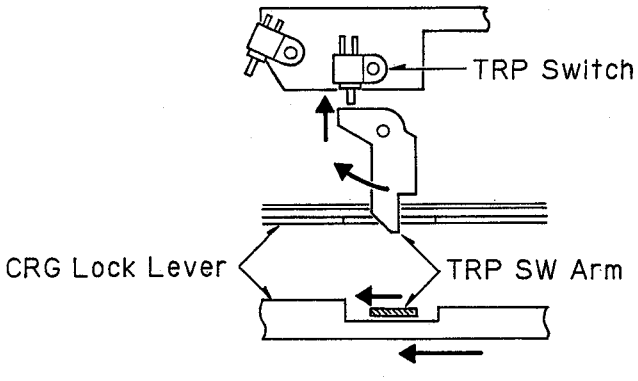
● **Tray extraction/insertion Completion Detection**

A) Play side(Fig. 31)

When play is complete, the CRG lock lever slides, pushing the tip of the TRP switch arm and turning the switch on.

B) Tray return side (eject side)(Fig. 32)

When tray return is complete, the tray extraction lever pushes the TRP SW lever, the TRP SW lever pushes the TRP SW arm, turning the TRP switch on.



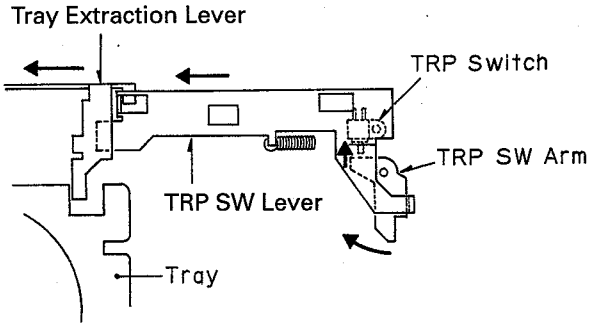




Fig.31

Fig.32

## ● Elevator Operation

1. The inside steer slides when the ELV motor is driven. The front steer interlinked with the inside steer also slides. The shaft protruding from the stage mechanism is interrelated with the three front/rear stage holes, and the stage moves up or down when the steer slides. A gravitational force counter spring and front steer spring is provided on the magazine side arm in order to relieve the difference in load caused by gravitational force for rising and lowering.

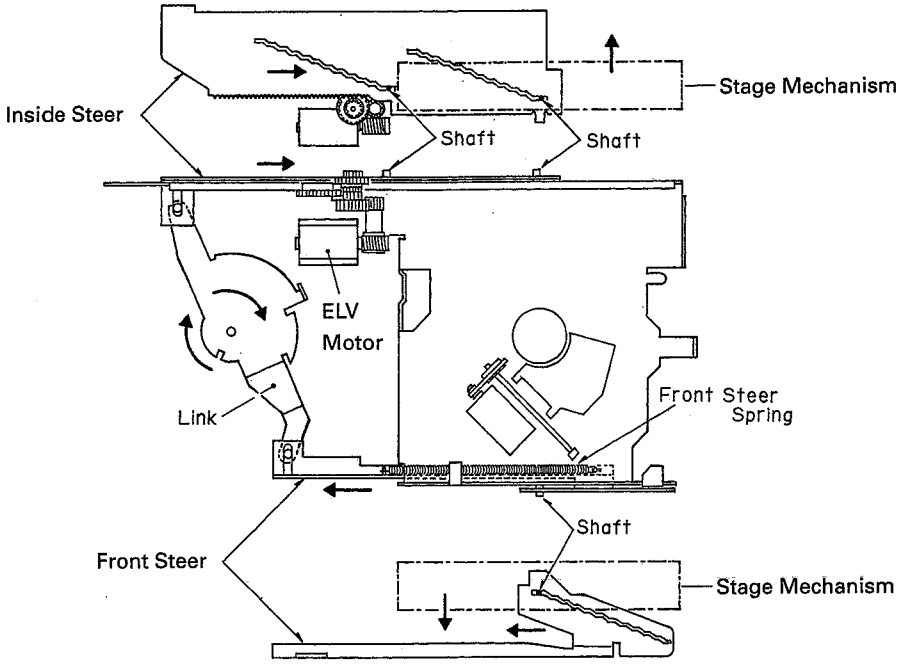



Fig.33

Gravitational force counter spring

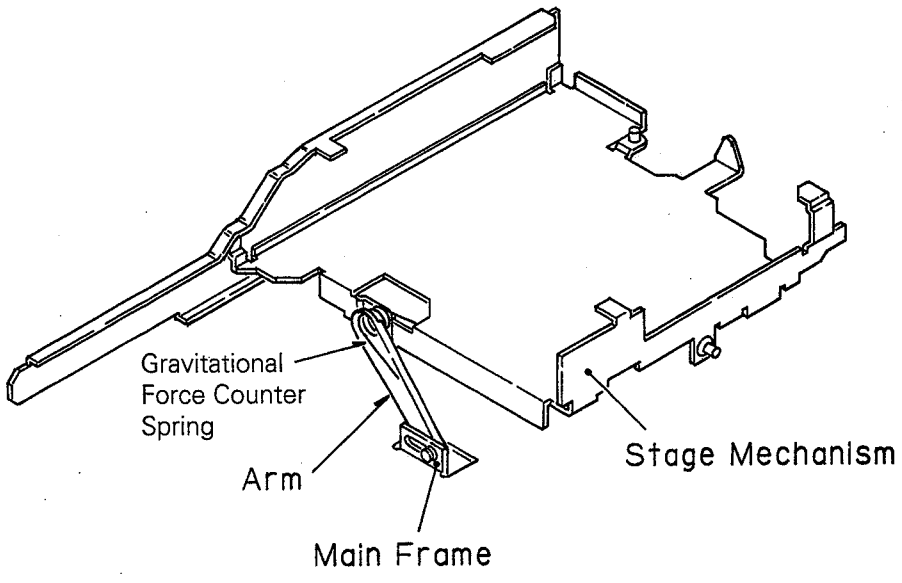



Fig.34

## ● Elevaton Detection

1. The gear B operates intermittently by moving a step when the gear A turns half circle, then stopping at the straight part of the step hole of the steering. The gear A has holes (two places) at this stepping position and the phototransistor detects these holes (Fig. 35).
2. The phototransistor detects the top step immediately after the RSTP switch is turned to ON. When the steering moves further, the gear A turns half circle and the phototransistor detects the next position of the hole. Thus, the system detects the position of magazine ejection (Fig. 36).
   Mechanical reset is detected at the same position as with the position of the top step.

- After the RSTP switch is turned to ON, the system detects resetting when the steering moves upward again from the point when it moved downward and the RSTP switch was turned to OFF.
- Operation after magazine ejection is the same as with resetting after the RSTP switch is turned ON.

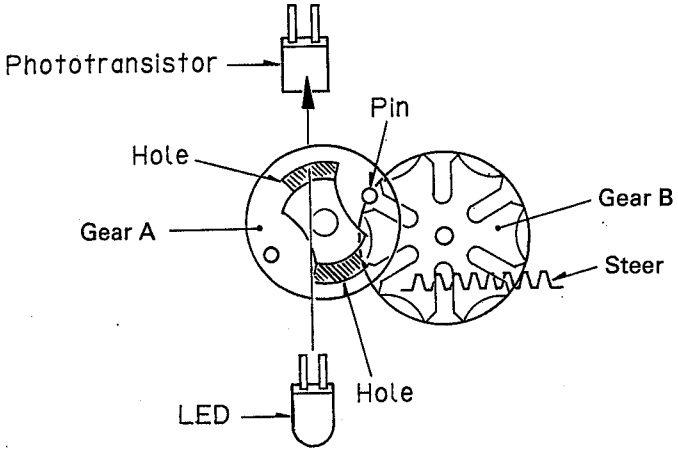



Fig.35

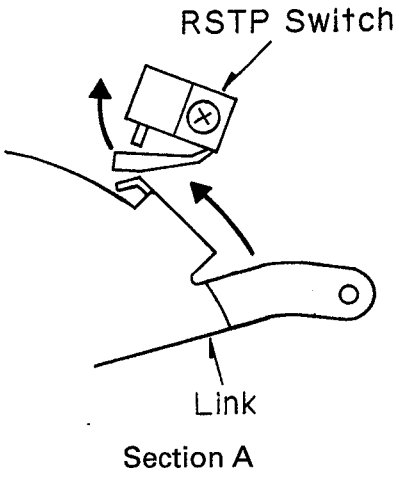



Fig.36

## ● Magazine Discharge

1. If the steer is further driven from the detection position of the elevator's highest stage, the contraction of the link pushes up the tip of the lock arm mentioned in "Magazine insertion." When it does, the lock part which is the tip of the other lock arm drops down below, releasing the magazine's lock. The magazine is discharged by the eject lever.

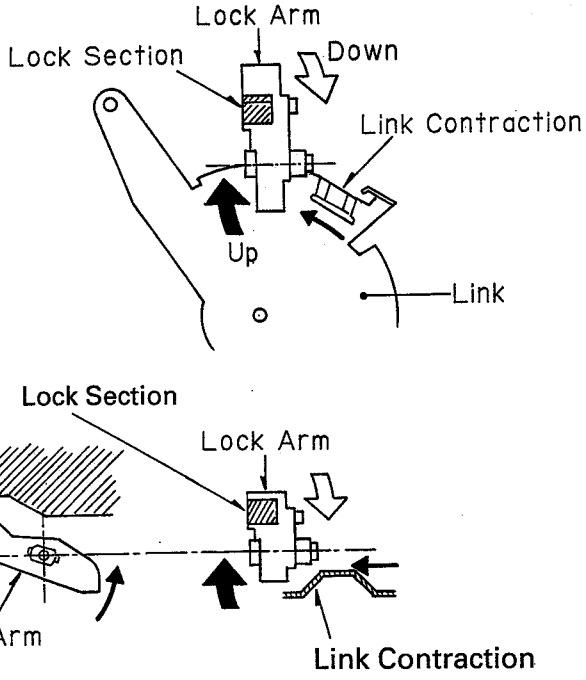



Fig.37